GoPro STUDIO

User Manual for Windows Operating Systems

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INTRODUCTION

Welcome to GoPro Studio, a video editing application that makes it easy to create professional-quality videos from your GoPro content.

What is GoPro Studio?

GoPro Studio software makes it easier than ever to create professional-quality videos with your GoPro content. We've taken our most popular GoPro videos and turned them into GoPro Edit Templates to help fast-track you to an incredible edit. The music, edit points, slow motion effects and more have been dialed—all you have to do is replace our video clips with yours. Or if you want to create your edits from scratch, you can do that too. Trim and mix clips. Adjust video playback speed for fast or slow motion. Add titles, music, voice-over audio tracks and more. Plus, you can take your GoPro CineForm files into other applications for advanced editing and processing.

When you're finished editing, you can export your movie to a format that's easy to share on YouTube™, Vimeo™ and other sites, or to a high-quality master file that can be used for broadcast outlets or archival purposes.

GoPro Studio enables you to do the following:

- Easily create GoPro-style videos using GoPro Edit Templates
- Mix, edit and add effects to any number of clips, filmed at different resolutions and frame rates, with no visual loss of quality
- Export your GoPro Studio projects as h.264 .mp4 files at up to 1080p resolution for sharing on YouTube or Vimeo
- Export a high-quality master file up to 4K resolution in the GoPro CineForm format for broadcast or archival purposes

GoPro Studio comes in three editions: GoPro Studio (available via free download at gopro.com), GoPro Studio Premium and GoPro Studio Professional. The majority of this User Manual focuses on the features common to all three versions. The additional features available in the Premium and Professional versions are covered in the chapter "GoPro Studio Premium and GoPro Studio Professional".

Learning Resources

GoPro offers several ways to help you learn how to use GoPro Studio. There's the User Manual that you are reading now and an online support website, gopro.com/studiosupport.

User Manual

The User Manual explains how to use GoPro Studio, giving an overview of the product's purpose and highlighting its various workflow options. It goes into detail about each and every feature that the software offers, explaining its purpose and usage. It's a great resource to help you get the most out of your GoPro Studio experience.

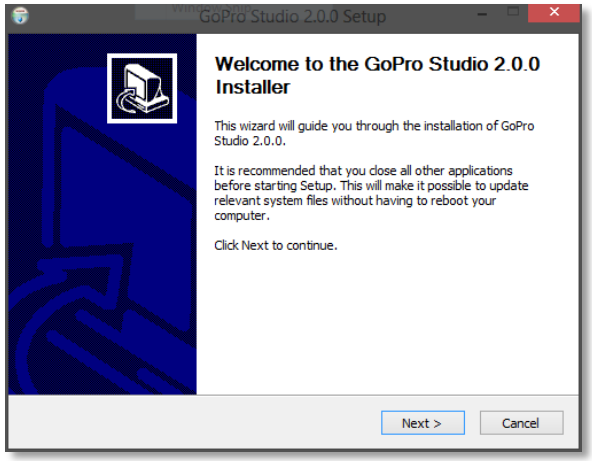
Readme File

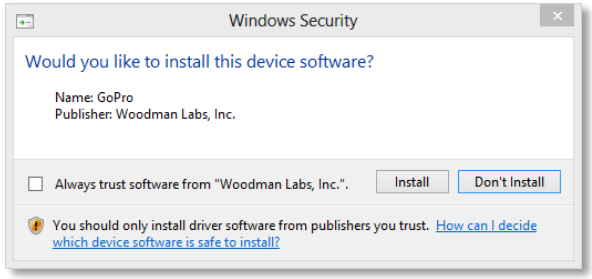
The Readme file installs with GoPro Studio and includes release notes for the current and previous versions as well as a list of current known issues.

Online Help and Support

In addition to the User Manual, further learning materials are available at gopro.com/studiosupport. There you'll find workflow tutorials and answers to frequently asked questions. If you have a question or issue that you don't see addressed in the tutorials or FAQ, please contact our support team and we'll be happy to help answer your questions.

Installing GoPro Studio


GoPro Studio 2.0.0 Setup
Welcome to the GoPro Studio 2.0.0 Installer
This wizard will guide you through the installation of GoPro Studio 2.0.0.
It is recommended that you close all other applications before starting Setup. This will make it possible to update relevant system files without having to reboot your computer.
Click Next to continue.
Next >
Cancel


Windows Security
Would you like to install this device software?
Name: GoPro
Publisher: Woodman Labs, Inc.
Always trust software from "Woodman Labs, Inc.".
Install
Don't Install
You should only install driver software from publishers you trust. How can I decide which device software is safe to install?

GoPro Studio is installed by launching the installer file that can be downloaded from gopro.com.

1. Verify that your computer meets the minimum system requirements for your operating system and hardware. System requirements can be found at gopro.com.
2. Download the correct version for your operating system and hardware and make sure that it is the version for which you are licensed (the free version doesn't require a license but the Premium and Professional versions do).
3. After the file has finished downloading, right-click on it in Windows Explorer (it should be called, 'GoProStudioPC-2.0.x.xxx.zip', where the x's are replaced by the version and build number) and select 'Extract All…'. Windows will then prompt you to choose a location where you'd like to unzip the file to. Click the 'Extract' button to unzip the file.
4. After the downloaded file has been unzipped, you'll see the installer file. Double-click on it (it should be called, 'GoProStudioPC-2.x.x.xxx.exe', where the x's are replaced by the version and build number). That will launch the installer where you will be guided through the rest of the installation process by the installation wizard.
5. If this is your first time installing GoPro Studio, during the installation process you will be prompted to install a device driver from Woodman Labs. It is completely safe to install this driver. In fact, we suggest that you check the "always trust drivers from Woodman Labs" checkbox. This will ensure that your compatible GoPro cameras and accessories will be properly detected by GoPro Studio for product software updates (more on this in the "Working with Devices" chapter).

NOTE: The GoPro Studio installation wizard automatically chooses the most appropriate default install location based on your system. Do not modify the default location unless you are an experienced user.

UNDERSTANDING THE WORKFLOW

There are two ways of using GoPro Studio. The first way is as a stand-alone, start-to-finish video editing application. The second way is to use GoPro Studio in tandem with other 3rd party video editing applications such as Adobe After Effects, Adobe Premiere Pro, Apple Final Cut Pro and others. This User Manual will discuss each of these workflows in separate chapters. The two workflows are as follows:

Using GoPro Studio as a Stand-Alone Application

In this workflow you trim and convert your camera source files into GoPro CineForm files, then use GoPro Studio to combine clips, add color effects and speed changes, music and titles, all using the built-in storyboard editor (the built-in Edit Templates make this a quick and easy process). Then you export your movie to various formats—YouTube, Vimeo or a high-quality Master file for archival purposes. With this workflow, all you need is a compatible computer and GoPro Studio.

Using GoPro Studio with 3rd Party Applications

In this advanced workflow, you convert your camera source files into GoPro CineForm files, use GoPro Studio to add color effects, adjust framing and other settings, then use those same GoPro CineForm files in other 3rd party applications for further editing or processing. This workflow requires another editing or compositing application be installed on your computer. Some of the popular professional applications are Adobe After Effects, Adobe Premiere Pro, Apple Final Cut Pro, Avid Media Composer and Sony Vegas. GoPro CineForm files are also compatible with various consumer-level products, such as iMovie, Adobe Premiere Elements Sony Movie Studio Platinum and Windows Movie Maker.

NOTE: GoPro CineForm files are saved as standard AVI and MOV files so applications that support those file formats should be able to use GoPro CineForm files.

Why Convert to the GoPro CineForm Format?

The first step in any GoPro Studio workflow is to convert your source files into the GoPro CineForm format. This is very important and there are several reasons to do this.

All consumer-level cameras and many professional-level cameras record in highly compressed video formats designed to capture large amounts of data very quickly and save that data onto an SD card or other portable media format in as small a file as possible. This is great for recording a lot of data onto a small space, but these compression formats are not designed nor optimized for maintaining image quality during editing or color correction processes. Because these formats are so compressed, they often require an ultra powerful computer to decode (playback) the files without performance degradation (choppy playback or dropped frames).

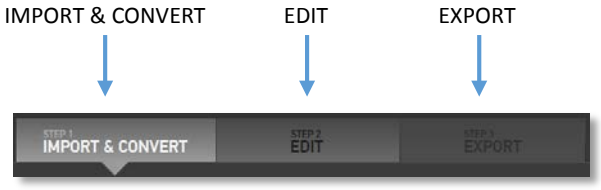
Because of this, many professional filmmakers and consumer-level videographers use what is called a Digital Intermediate (DI). A DI is an exact copy of the data from the original video file saved in a file format that is specifically optimized for higher image quality and fast playback on modern computer systems. This makes for a much better editing experience.

The GoPro CineForm format (or codec) is the Digital Intermediate (DI) used in all GoPro Studio workflows and is one of the best in the industry—used by indie filmmakers and Hollywood studios alike.

Ultimately, GoPro CineForm files are better for editing than camera source files. They improve on image quality and playback speed, as well as provide the Active Metadata™ architecture required to enable the real-time image development and enhancement features available in GoPro Studio's EDIT Room.

NOTE: You can learn more about the GoPro CineForm Codec and its Active Metadata™ technology in the APPENDIX section of this User Manual.

OVERVIEW OF THE USER INTERFACE



Work Area Selection Buttons

The GoPro Studio application consists of three main workflow steps:

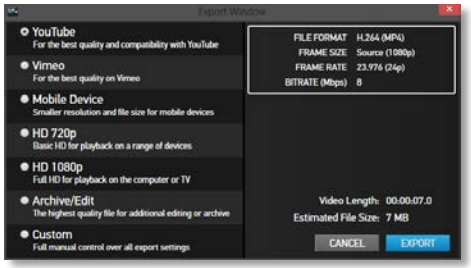
- **Step 1: IMPORT & CONVERT**
- **Step 2: EDIT**
- **Step 3: EXPORT**

Each of these steps is accomplished using three different work areas in the user interface. When you launch GoPro Studio, IMPORT & CONVERT is the active work area. The Work Area Selection buttons at the top of the user interface allow you to switch between the IMPORT & CONVERT, EDIT and EXPORT work areas.

NOTE: The first time you launch GoPro Studio, the Import Tutorial will appear. The Import Tutorial gives you a brief walkthrough of how to use the IMPORT Room. You can step through the tutorial using the NEXT buttons or cancel out of it by clicking the SKIP TUTORIAL button.

STEP 1: IMPORT & CONVERT

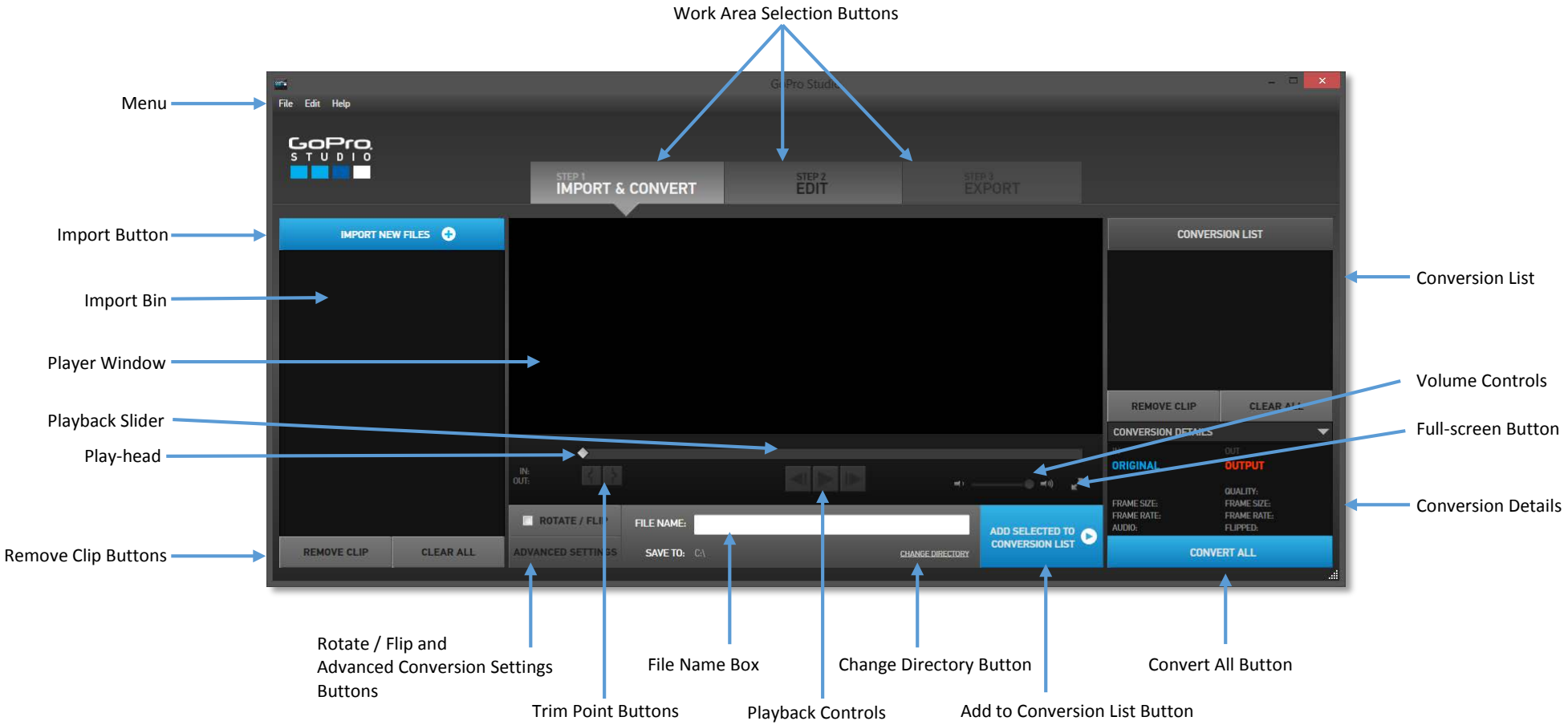
STEP 2: EDIT


YouTube
For the best quality and compatibility with YouTube
Vimeo
For the best quality on Vimeo
Mobile Device
Smaller resolution and file size for mobile devices
HD 720p
Basic HD for playback on a range of devices
HD 1080p
Full HD for playback on the computer or TV
Archive/Edit
The highest quality file for additional editing or archive
Custom
Full manual control over all export settings
FILE FORMAT H.264 (MP4)
FRAME SIZE Source (1080p)
FRAME RATE 23.976 (24p)
BITRATE (Mbps) 8
Video Length: 00:00:07.0
Estimated File Size: 7 MB
CANCEL
EXPORT

STEP 3: EXPORT

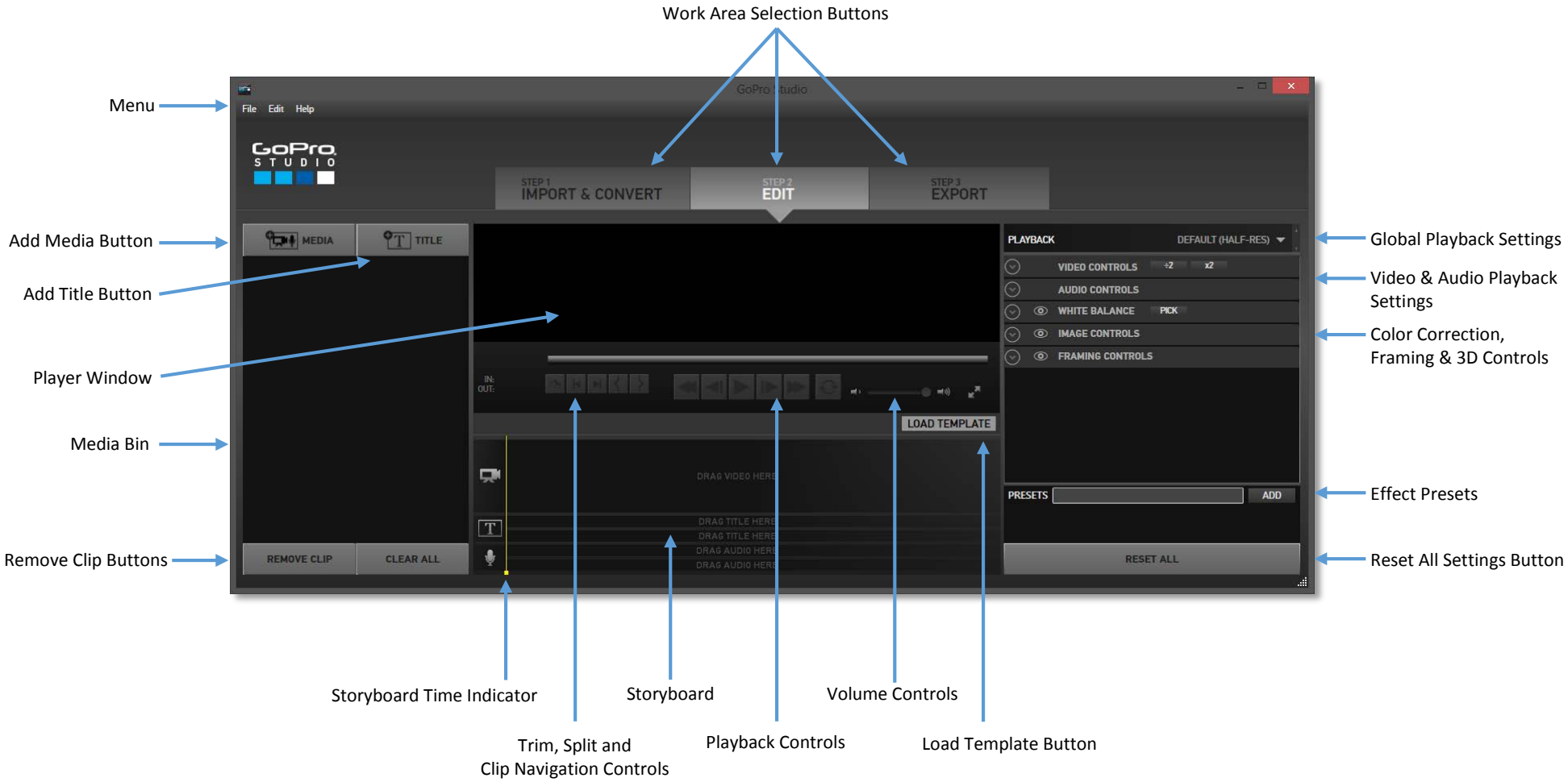
Step 1: IMPORT & CONVERT

The **IMPORT & CONVERT** work area, or “IMPORT Room”, is where you import your source files, select initial trim points using your best footage and choose advanced conversion settings. You then add your source files to a conversion list for batch processing into GoPro CineForm files. If you have not converted any of your source files into GoPro CineForm files, this is where you should start.



Step 2: EDIT

The **EDIT** work area, or “EDIT Room”, is where you do further trimming, combine multiple videos on a storyboard and add effects, music and titles. If you have already converted your source files to GoPro CineForm files, click the **STEP 2 EDIT** button at the top of the user interface to switch to the **EDIT Room**.



Player Window

The Player Window's Three States

In the EDIT Room, the Player Window is used to playback your files and clips. The Player Window displays the contents of the Media Bin, the complete Storyboard as well as individual clips on the Storyboard.

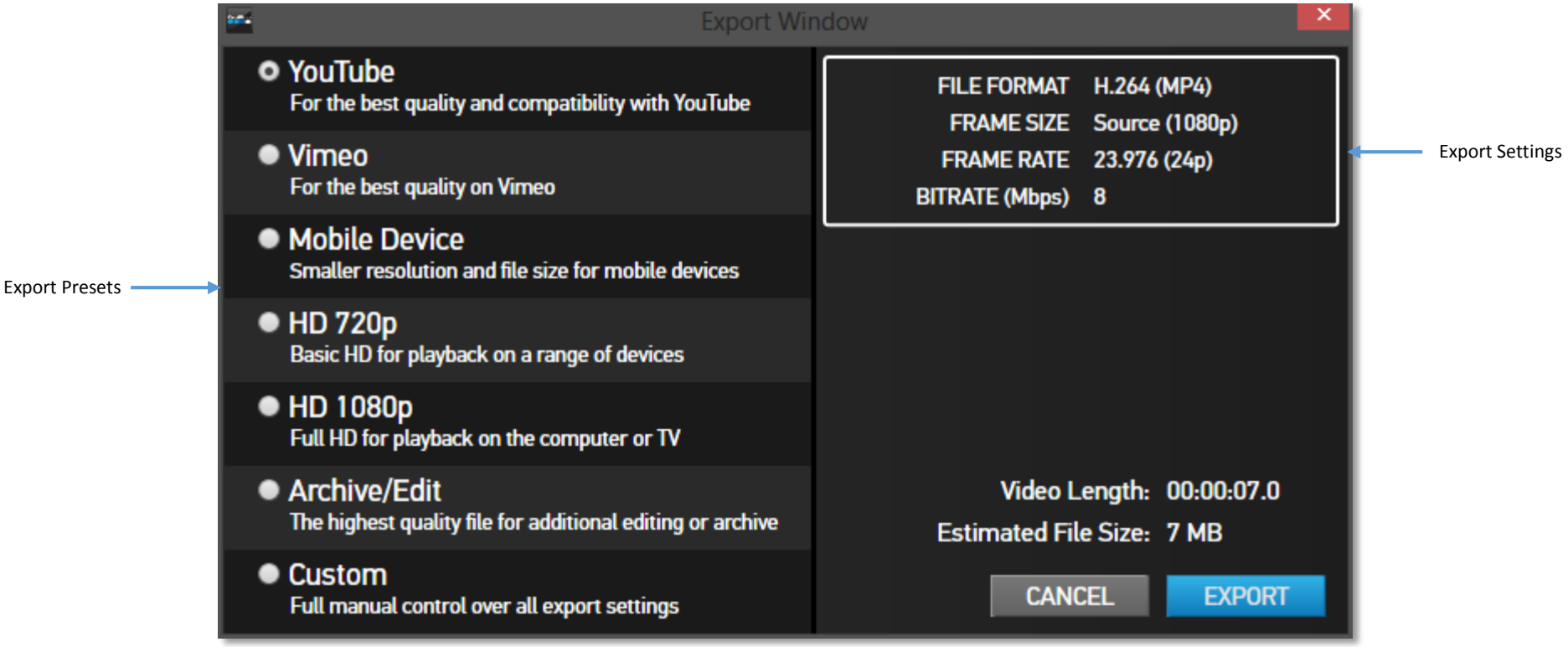
The Player Window has three different states which are determined by the area of focus in the EDIT Room work area.

1. When a file or clip is selected in the Media Bin, the Player Window will display the current frame in selected file. The Storyboard becomes grayed out when the Player Window is being used by clips in the Media Bin.
2. When the Storyboard is selected, the Player Window will display the contents of the Storyboard. You can use the yellow Storyboard Time Indicator bar to drag to specific locations on the Storyboard. As you do, the Player will update to display the current frame.
3. When an individual clip is selected in the Storyboard, adjusting the IN or OUT point markers will cause the Player Window to display only the selected clip. When this happens, the yellow Storyboard Time Indicator bar on the Storyboard will become grayed out, indicating that only one clip is being used in the Player Window rather than the entire Storyboard.

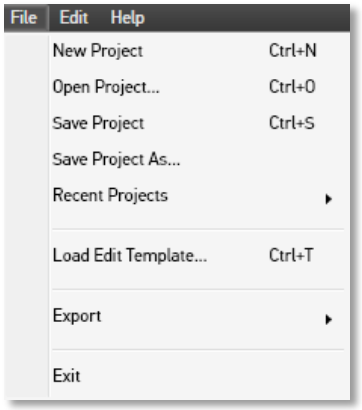
More specific information about the Player Window and Playback Controls can be found throughout the User Manual.

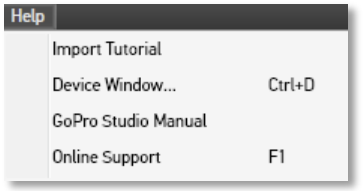
Step 3: EXPORT

The **EXPORT** work area, or “EXPORT Window”, is where you export your movie to a new file, ready to share with the world. Here you’ll be able to choose from a variety of preset export formats or create your own custom export setting. When you are done editing your project in the EDIT Room, click the **STEP 3 EXPORT** button to launch the **EXPORT Window**.



Menu Commands





The menu at the top of the IMPORT & CONVERT and the EDIT work areas is comprised of three main menus, **FILE, EDIT** and **HELP**.

The **FILE** menu includes the following commands:

- New **Project** creates a new GoPro Studio project.
- **Open Project** opens an existing GoPro Studio project.
- **Save Project** saves the current GoPro Studio project.
- **Save Project As** saves the current GoPro Studio project with a new name.
- **Recent Projects** shows a sub-menu listing recently used GoPro Studio projects.
- **Load Edit Template** launches the Edit Template Selection Window.
- **Export** with sub-menu of Export Movie and Export Image.
- **Exit** closes GoPro Studio.

The **EDIT** menu includes the following commands:

- **Redo** allows you to redo an action after previously using the 'Undo' command.
- **Undo** allows you to undo the 50 most recent change to the storyboard.
- **Copy** copies Storyboard elements and clip attributes to the Windows clipboard.
- **Paste** pastes Storyboard elements and clip attributes from the Windows clipboard to the Storyboard or Storyboard elements.
- **Clear Storyboard** clears the Storyboard of all content.

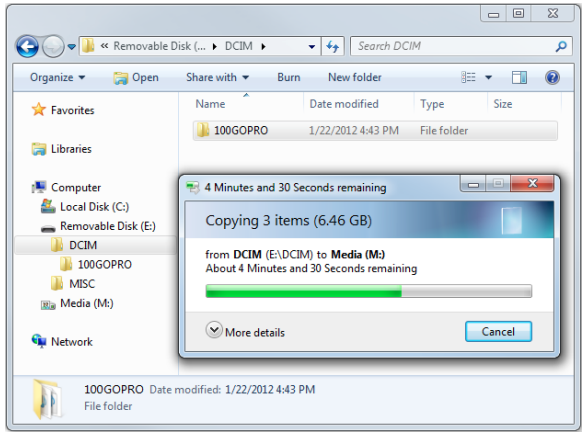
The **HELP** menu includes the following commands:

- **Launch Import/Edit Tutorial** opens the Import or Edit Room Tutorial.
- **Device Window** opens the Device Window where you can update HERO2, Wi-Fi BacPac™ and Wi-Fi Remote product software (HERO3 camera software is updated at gopro.com/update).
- **GoPro Studio Manual** opens the GoPro Studio User Manual.
- **Launch Help Page** launches your default web browser to the GoPro.com help page.

USING GOPRO STUDIO

When starting a new GoPro Studio project, there are a few steps to take before launching the GoPro Studio application.

Transferring Video Files to Your Computer



Your GoPro camera records video files in the DCIM directory on your SD card. There are two ways to access these files on your computer:

- **Method 1:** Connect the camera to your computer using a USB cable, then turn the camera ON.
- **Method 2:** Remove the SD card from the camera and use an internal or external SD card reader (this method requires a microSD card adapter if you use a HERO3 camera).

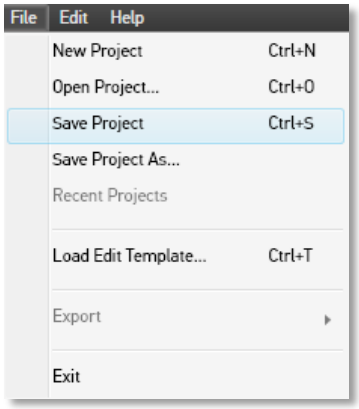
Once you have mounted your SD card using one of the methods above, Windows may try to automatically import the files using the Photo and Video Import Wizard (or some other file import method). It is recommended that you cancel out of the Import Wizard and instead use Windows File Explorer to browse to the DCIM folder on your SD card.

Then copy and paste the video files from the DCIM folder to a location on your computer. We suggest creating a specific folder for your GoPro Studio projects.

NOTE: GoPro video files can be quite large and GoPro CineForm files (especially 3D files) are even larger. With this in mind, make sure you have plenty of disk space for both your source files and the converted GoPro CineForm files.

Step 1: IMPORT & CONVERT

Now that your source files have been copied to your computer, you're ready to bring them into GoPro Studio and prepare them for conversion into GoPro CineForm files.



Creating a New Project

Launch GoPro Studio by double-clicking on the **GoPro Studio** desktop icon.

NOTE: If this is your first time launching GoPro Studio, the Import Tutorial will appear. The Import Tutorial gives you a brief walkthrough of how to use the IMPORT Room. You can step through the tutorial by using the NEXT buttons or cancel out of it by clicking the SKIP TUTORIAL button.

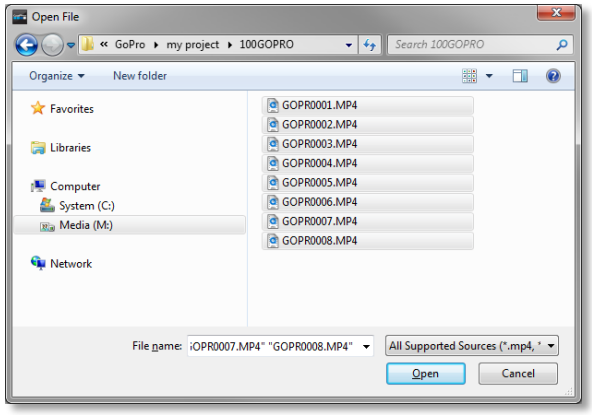
Before going any further, it's a good idea to save the project and give it a project name.

1. Go to the **File** menu and click **Save Project** (or press 'Ctrl+S' on your keyboard).
2. Browse to the folder where you would like to save your project.
3. Type a name for your project in the **File name** box.
4. Click the **Save** button to create the new project file.

NOTE: Your new GoPro Studio project file will be saved with a ".GCS" file extension.

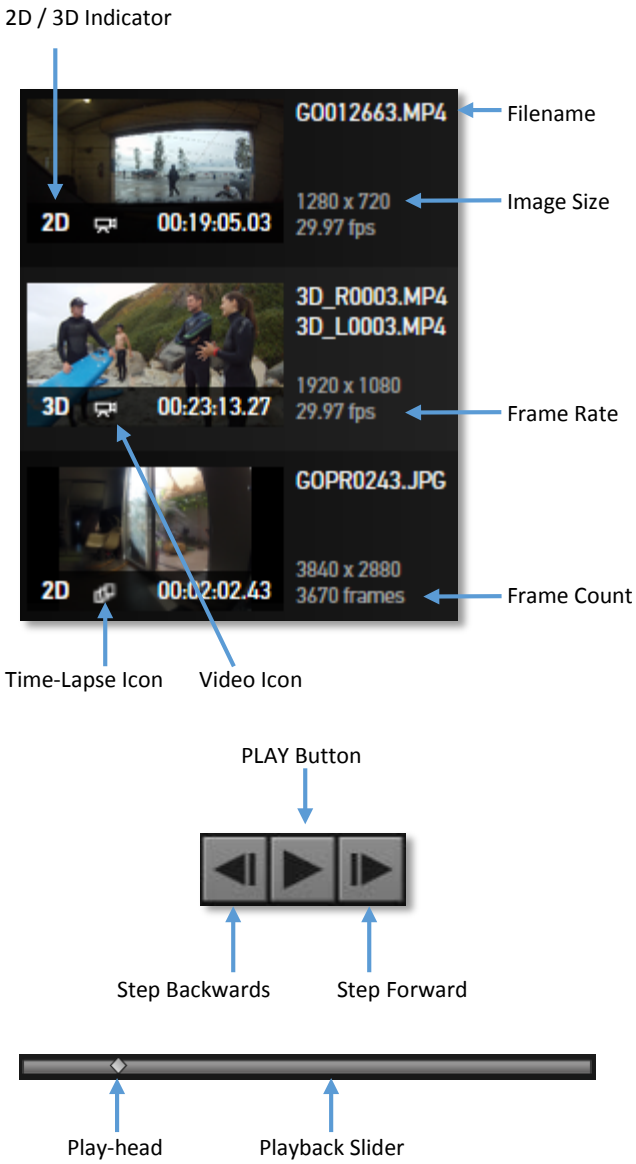
Importing Source Video Files

To import your video files, do the following:



1. Click the **IMPORT NEW FILES** button (or right-click in the Import Bin and select **Import Files**) and browse to the project folder that contains the files you want to import.
2. Highlight the videos you want to import and click **Open**.
3. Press 'Ctrl+S' on your keyboard to save the project.

TIP: You can import an entire folder of clips by simply dragging the folder from Windows File Explorer and dropping it onto the Import Bin.



Previewing Files in the Player Window

After importing your files, you'll see them represented as thumbnails in the Import Bin on the left-hand side of GoPro Studio's IMPORT Room. Along with each thumbnail, the following file details are indicated:

- **Filename**
- **Image Size**
- **Frame Rate or Frame Count**
- **2D or 3D**
- **Video or Time-Lapse Icon**
- **Duration**

You can select files in the Import Bin by clicking on them or using the up and down arrow keys on your keyboard to cycle through them.

To remove a clip from the Import Bin, select the clip you wish to remove and click on the **REMOVE CLIP** button at the bottom of the Import Bin or press the 'DELETE' key on your keyboard.

To remove all clips from the Import Bin, click the **CLEAR ALL** button at the bottom of the Import Bin.

You can preview your files in the Player Window by using the Playback Controls.

- With a clip selected, press the **PLAY** button in the Playback Controls (or the SPACEBAR on your keyboard) to see the clip playback in the Player Window.
- Use the **Step Forward** and **Step Backwards** buttons to step through the clip one frame at a time.

NOTE: Depending on your computer specifications and the in-camera recording format used, the files may play back choppy. This is to be expected and one of the reasons we will be converting the files into the GoPro CineForm format.

You can also use the Play-head on the Playback Slider to navigate through the clip. To do this, click on the diamond-shaped Play-head and drag left or right through the Playback Slider. While doing this, the Player Window will update to show the current frame.

Converting Files

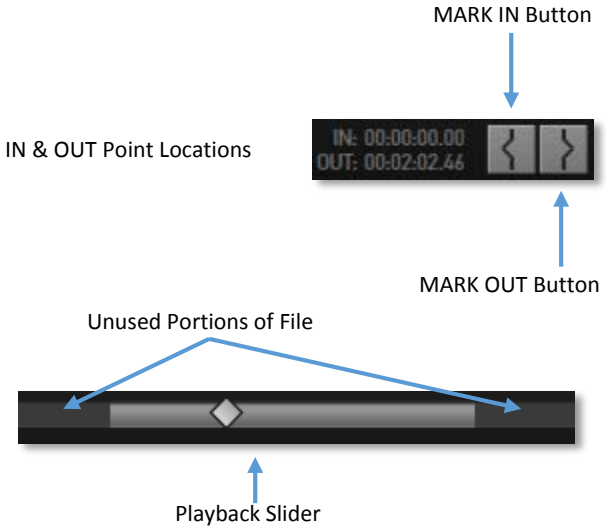
You can rotate, trim and select advanced conversion settings on a file before converting it into a GoPro CineForm File. There are different reasons for performing each of these actions, as explained below.

Using the Rotate / Flip Option

When shooting with a GoPro camera, some situations will require you to mount it upside-down. There is an in-camera setting to flip the video during recording (which we recommend you use). If you forgot to use that option, GoPro Studio gives you an easy way to account for this in the converted GoPro CineForm file.

1. Select a source file by clicking on it in the Import Bin.
2. Click on the **ROTATE / FLIP** button.

After performing these steps your file will appear right-side-up in the Playback Window, and after the conversion your converted GoPro CineForm file will be right-side-up as well.



Setting Initial Trim Points

GoPro Studio lets you trim your source file before converting it to a GoPro CineForm file. This is helpful in reducing the size of the converted file and it eliminates any unwanted portions of the initial recording from being included in the converted file. By using the **MARK IN** and **MARK OUT** buttons you can trim the file to include only the portion(s) of the recording that you actually want to keep. Do this to choose your favorite shots and to make your editing experience easier and more fun.

1. Select a source file by clicking on it in the Import Bin.
2. Move the Play-head on the Playback Slider to the desired start point of your clip and press the **MARK IN** button to trim the beginning of the file.
3. Now move the Play-head to the desired end point of your clip and press the **MARK OUT** button to trim the end of the file.

Clicking on the **MARK IN** and/or **MARK OUT** buttons will mark your trim points by darkening the unused portions of the file on the Playback Slider. To undo your trimming, simply move the Play-head to a new location and click on the **MARK IN** or **MARK OUT** button again.

Now you can add the file to the Conversion List or set advanced conversion settings.

TIP: If you want to convert multiple portions of the same source file, mark the IN and OUT points for the first clip and then add it to the conversion list. Then repeat the IN and OUT point marking process to choose new trim points for the second clip and then add the second clip to the conversion list. Repeat these steps for as many clips as you would like to make from the original file.

Choosing Advanced Conversion Settings

When you select a file for conversion, GoPro Studio chooses default conversion settings based on the file's original format. You can keep the default settings or customize them to meet specialized needs. This section will provide information about the various advanced conversion settings and explain why they are useful in certain situations.

Click on the **ADVANCED SETTINGS** button to open the Advanced Settings Window.

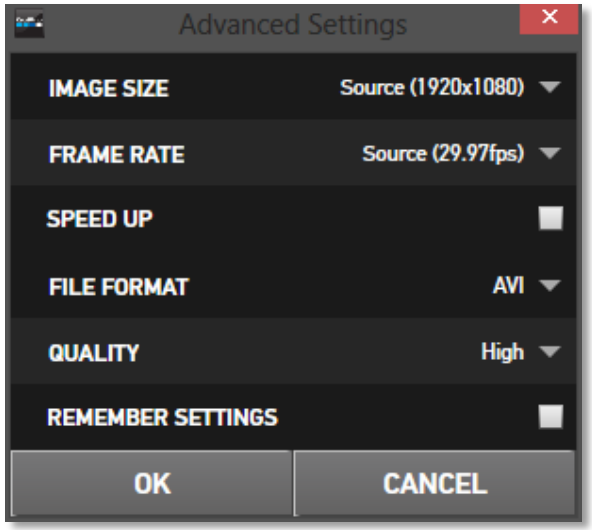
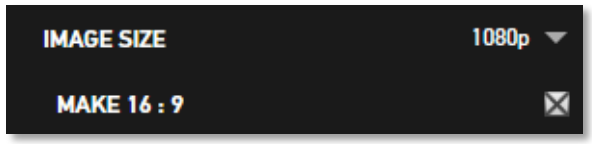


IMAGE SIZE

Use the **IMAGE SIZE** setting to adjust the resolution of the converted clip. The source file's resolution is identified by the word "Source" next to it (as shown in the screenshot to the left). You can keep the source setting or change it to a different resolution. Some reasons to change the resolution are as follows:

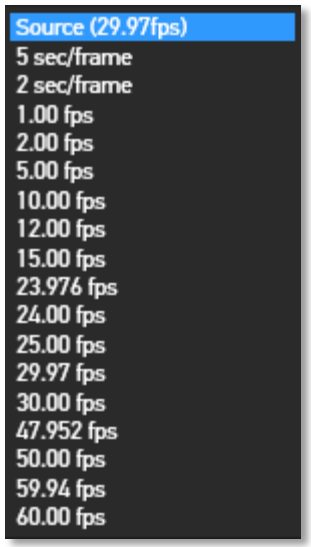
- You shot at a higher resolution than your desired output format (e.g. source was 2.7K but your output format is 1080p)
- You shot at a lower resolution and want to upscale it to a resolution that matches your desired output format (source was 720p 120fps but your output is 1080p 30fps)
- You shot in a format that uses a 4:3 aspect ratio but your desired output format is 16:9

NOTE: In GoPro Studio's EDIT Room, you can mix and match resolutions on a single storyboard so it is not crucial that you change the image size in the conversion process. However, if you are planning on taking your converted clips into other applications that don't let you mix resolutions, it's a good idea to convert to the resolution that you'll be using in those applications.



MAKE 16:9

The **MAKE 16:9** option appears as a checkbox when you select a new IMAGE SIZE of 1080p or smaller and the source video has a 4:3 aspect ratio. When checked, it scales and stretches the 4:3 image to fill a 16:9 frame.

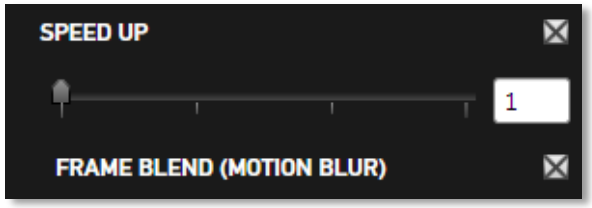


FRAME RATE

Use the **FRAME RATE** setting to adjust the frame rate of the converted file. The source file's frame rate is identified by the word 'Source' showing next to it. One reason to change the frame rate is to create a smooth slow-motion effect. Let's say that you recorded using one of the camera's higher frame rate modes, such as 1080p 60. Using the Frame Rate option you could change the frame rate to 30 fps resulting in a converted file that plays in slow-motion at half the speed of the original source file.

Please note that frame rates below 23.976 are meant to be used with Time-Lapse sequences, so avoid those if you are working with video files. We'll discuss more about Time-Lapse conversions in the section "Working with Time-Lapse Sequences".

NOTE: In GoPro Studio's EDIT Room, you can mix and match frame rates and change the speed of clips on a single storyboard so it is not crucial that you change the frame rate in the conversion process. However, if you are planning on taking your converted clips into other applications that don't let you mix frame rates, it's a good idea to convert to the frame rate that you'll be using in those applications.



SPEED UP and FRAME BLEND (MOTION BLUR)

Using the **SPEED UP** option is a great way to simulate a time-lapse look from video files. When checking this option, a slider and entry box appear. Use the slider to select the number of video frames to be skipped or type a number in the box. The more frames you skip, the more sped up the converted file will be.

The **FRAME BLEND** option also appears once you've checked the Speed Up option. Check this option to give your converted file a motion-blur effect, which is often useful to produce the smoothest time-lapse output.

FILE FORMAT

GoPro CineForm files can be saved as Windows AVI files or QuickTime MOV files. The **FILE FORMAT** option in the Windows version of GoPro Studio lets you choose which of these format 'wrappers' you would like to save your files into.

NOTE: QuickTime must be installed in order to create QuickTime MOV files.

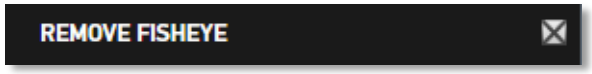
TIP: If you're not sure which format to choose, consider the fact that most Windows applications use AVI files and most Mac applications use MOV files. So for most Windows-based workflows, its best to leave this setting at the default AVI format, but if you're planning on using these files on a Mac, select the MOV format.

QUALITY

The **QUALITY** setting affects the data-rate used in the converted GoPro CineForm file. The data-rates will always vary, based on the complexity (image detail) in the source file, but you can choose whether to use **Low, Medium** or **High**.

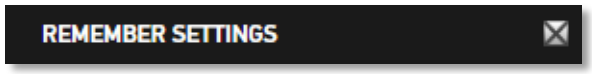
The default is **Medium** which will be a very high-quality video file. You can choose **High quality**, which may or may not end up creating a significant visual quality difference in the image. If you know you need to make significant changes to color in a clip, the extra quality might be beneficial but it will create a larger file and may take longer to process when you choose to convert. Even the **Low** quality setting is a relatively high-quality video file yet takes up less space on your hard drive.

REMOVE FISHEYE

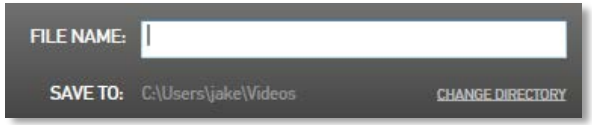


GoPro cameras are famous for their wide-angle look. This is beneficial if you want your image to have a large field of view (FOV). However, in some situations you might want to reduce the FOV that you get when shooting in one of the camera's wide modes. Checking the **REMOVE FISHEYE** option applies a "lens adjustment" to the converted GoPro CineForm file giving it a smaller FOV.

REMEMBER SETTINGS



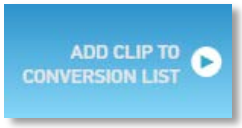
To process future clips in your Import Bin with the same settings, check the **REMEMBER SETTINGS** box before closing the Advanced Settings window.



Selecting a Destination for Converted Files

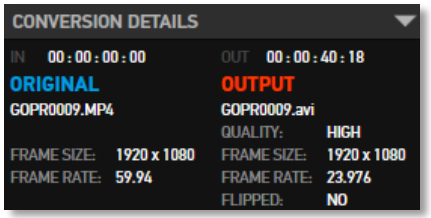
To specify a file name or destination other than the default provided for the converted file, use the **FILE NAME** text box (below the Playback Controls) and the **CHANGE DIRECTORY** button.

TIP: Holding down the 'Ctrl' key on your keyboard while clicking on the CHANGE DIRECTORY button will change the SAVE TO location to be the same location as the selected source file.



Adding Files to the Conversion List

Whether or not you've flipped your file, trimmed it, changed the conversion settings or renamed it, when you're ready to convert it select it in the Import Bin and click the **ADD CLIP TO CONVERSION LIST**. You should now see the file's thumbnail in the CONVERSION LIST. Repeat this step for as many clips as you'd like to convert.



TIP: You can select multiple clips in the Import Bin and add them to the conversion list all at once. To do this, hold down the 'Ctrl' or 'Shift' keys while selecting files in the Import Bin, or press 'Ctrl+A' on the keyboard to select all the clips at once. With the clips selected, click the ADD CLIP TO CONVERSION LIST button.

To verify that the clips in the Conversion List will be converted with the correct settings, click on the little arrowhead to the right of the words "CONVERSION DETAILS" towards the bottom of the CONVERSION LIST. The settings for the original file are shown on the left and the settings for the converted GoPro CineForm file are shown on the right.

When your clips have been added to the Conversion List, click the **CONVERT ALL** button to start the batch conversion process. Once the batch has started, you can still add more clips to the conversion list, if needed. When the conversion is complete, click the **PROCEED TO STEP 2** button to switch to the **EDIT Room**.

Before moving on to the next chapter, let's take a moment to look at the techniques used to convert time-lapse sequences into GoPro CineForm files as the import and conversion steps for these source files require some specific considerations.

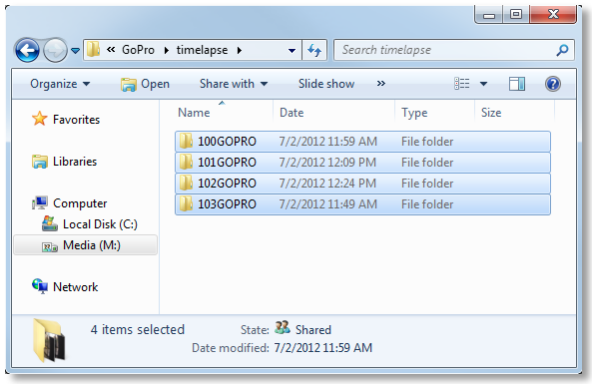
Working with Time-Lapse Sequences

The process for converting time-lapse sequences into GoPro CineForm files is similar to one used for converting video files. However, there are a couple of minor differences in how you go about importing the files and choosing your conversion settings.

About the File Structure

When you record a time-lapse on your GoPro camera, the images are saved as individual .JPG files (or frames) in a folder called "100GOPRO". If your recording contains more than 999 frames, the camera breaks the files up into separate folders. The second folder will be called "101GOPRO" and the third "102GOPRO", etc. In order for GoPro Studio to convert the files properly, you'll need to keep the folders separate, just like they are on the SD card.

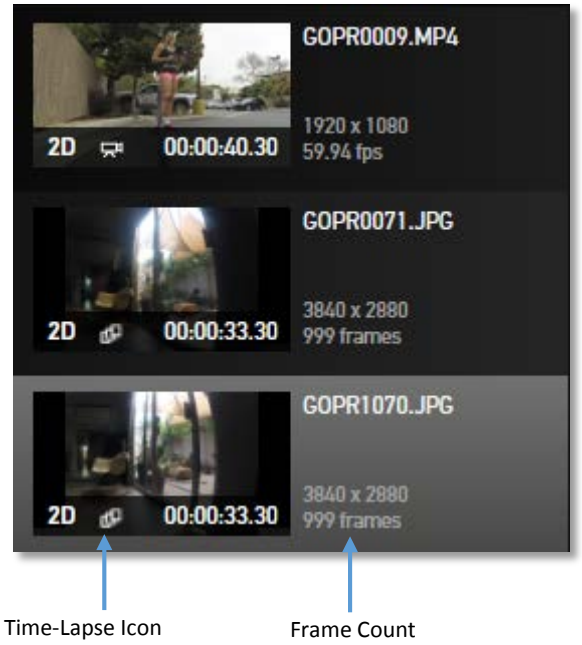
Importing Time-Lapse Sequences



The process for converting time-lapse sequences into GoPro CineForm files is as follows:

1. Copy the time-lapse folders from the DCIM folder on the SD card to a location on your computer. We suggest creating a specific folder for your GoPro Studio projects.
2. Click the **IMPORT NEW FILES** button and browse to the folder that contains the time-lapse sequences you want to import.
3. Highlight the folders you want to import and click **Open**.
4. Press 'Ctrl+S' on your keyboard to save the project.

NOTE: You can import an entire folder of frames by simply dragging the folder from Windows Explorer and dropping it onto the Import Bin.



Previewing Files in the Player Window

After importing your sequence folders, you'll see them represented as thumbnails in the Import Bin on the left-hand side of GoPro Studio's IMPORT Room. There are a couple of things that differentiate these from your video files.

- The Time-lapse icon is shown directly under the thumbnail instead of the video icon.
- The number of frames is shown rather than a specific frame rate

Despite the differences, you can still preview a time-lapse sequence in the Player Window by selecting it in the Import Bin and using the Playback Controls.

Trimming, Rotating and choosing Conversion Settings

Time-lapse sequences can be trimmed and flipped in the same way that video files can be, but when choosing your advanced conversion settings there are some additional things to consider.

IMAGE SIZE

Time-lapse sequences can be recorded using the different shooting modes (accessible in the camera menu). Each of these modes results in a different resolution.

You can convert these files using the Source resolution, but doing so will result in very large files. If the final output of your project is intended for broadcast or uploading to the web, consider downscaling the time-lapse to 1080p during the conversion process. This will create a smaller and more manageable file.

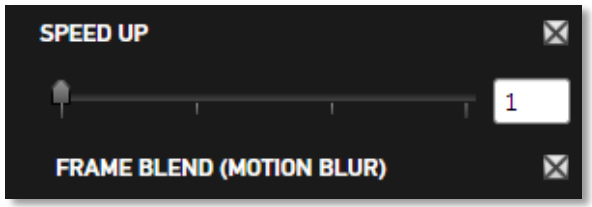
TIP: The benefit to converting the sequence using the source file's resolution is that you can zoom in and pan to specific regions within the larger frame size without degradation of image quality during editing but it will require a faster computer to ensure smooth file playback.

FRAME RATE

When converting time-lapse sequences, GoPro Studio sets the default frame rate to 29.97 frames per second. So if you have a sequence consisting of 300 frames at 29.97 frames per second, your converted clip will play for about 10 seconds. If you want the same number of frames to play for a longer span of time, change the Frame Rate value to a lower setting.

NOTE: Choosing the exact frame rate prior to conversion is not crucial because you can always speed up or slow down the converted GoPro CineForm clip on the Storyboard in the EDIT Room.

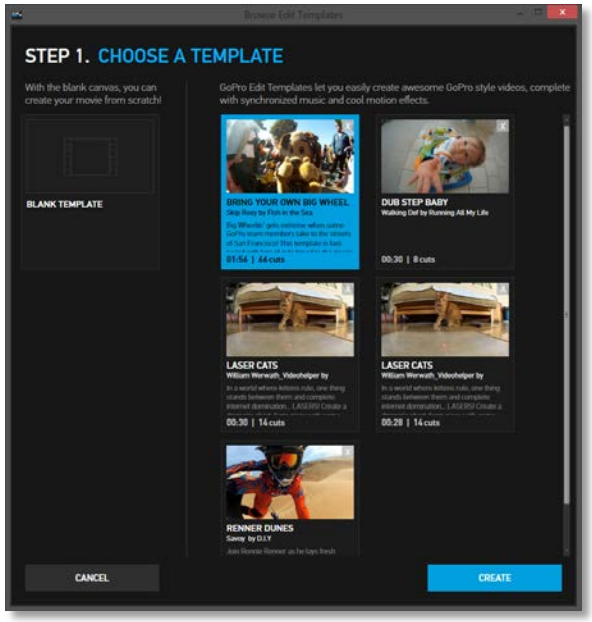
SPEED UP and FRAME BLEND (MOTION BLUR)



Speeding up a clip is a great way to remove extra frames in a time-lapse sequence. When checking SPEED UP option, a slider and entry box appear. Use the slider to select the number of time-lapse frames to be skipped or type a number in the box. The more frames you skip the more sped up the converted file will be.

The FRAME BLEND option also appears once you've checked the SPEED UP option. Check this option to give your converted file a motion-blur effect.

Step 2: EDIT


STEP 1. CHOOSE A TEMPLATE
With the blank canvas, you can create your movie from scratch!
GoPro Edit Templates let you easily create awesome GoPro style videos, complete with synchronized music and cool motion effects.
BLANK TEMPLATE
BRING YOUR OWN BIG WHEEL
DUB STEP BABY
LASER CATS
LASER CATS
RENNER DUNES
CANCEL
CREATE

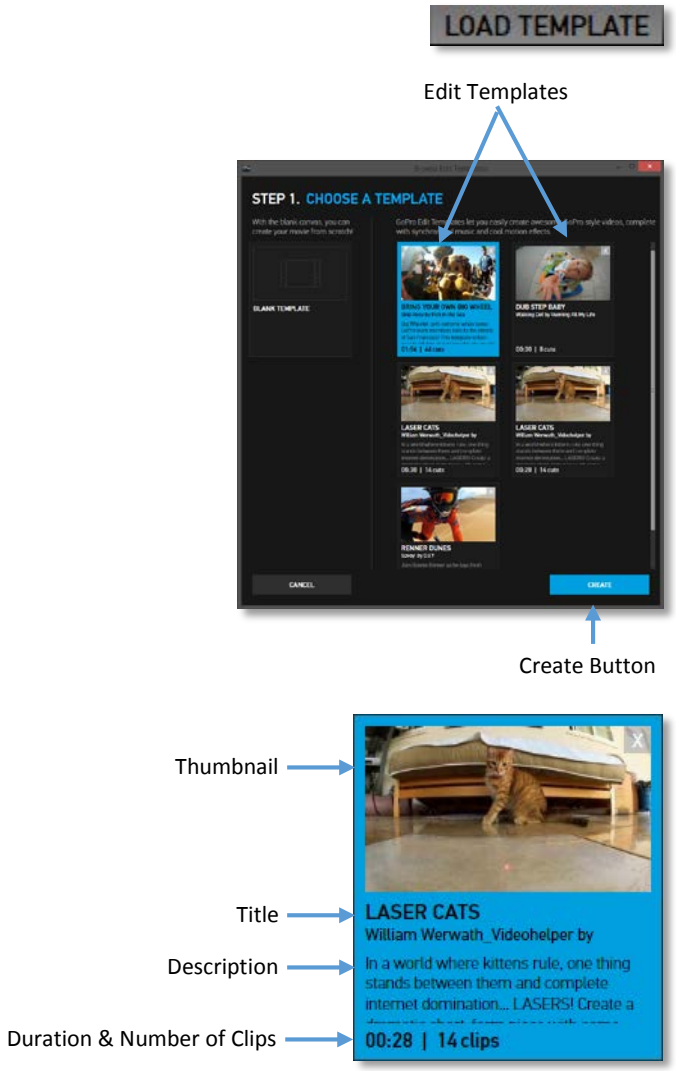
GoPro Studio's **EDIT Room** allows you to view, rearrange and enhance your converted GoPro CineForm clips.

In the Edit Room you can:

- Trim and combine multiple clips on a storyboard
- Add transitions
- Add music or other audio
- Add titles
- Change playback speed
- Add fade in and fade out effects
- Adjust color, framing and 3D convergence
- Apply preset 'looks' to create dramatic effects on your clips

When you first open the EDIT Room, the **Browse Edit Templates** window will appear. In this window, you're presented with the option to use a blank template or to choose from a list of available Edit Templates.

In this chapter you'll learn about how to create a movie using one of GoPro Studio's Edit Templates as well as how to create a movie from scratch using a blank template.



Using GoPro Edit Templates

GoPro Edit Templates are based on our most popular GoPro videos, and make it easy for you to turn your content into epic GoPro-style edits.

Follow these steps to create a video using an Edit Template:
.

1. Select a GoPro Edit Template from the Browse Edit Templates window.
2. The Edit Template then populates the Storyboard, complete with sample video clips, music and titles.
3. Replace the Edit Template content on the Storyboard with your own content.
4. Then you're ready to export the Storyboard and share it with the world.

Selecting a GoPro Edit Template

The Browse Edit Template window lists the available Edit Templates installed on your computer. GoPro Studio installs with three Edit Templates and you can install more by downloading them from the GoPro Edit Template gallery at gopro.com.

1. If you're not already looking at the **Browse Edit Template** window, make sure you're in GoPro Studio' EDIT Room and click on the **LOAD TEMPLATE** button located directly above the Storyboard or press 'Ctrl+T' on your keyboard.
2. Browse the Edit Template Selection Window to find the GoPro Edit Template that you would like to use. Notice that each Edit Template lists the title, artist and song, a brief description, duration, number of clips used and tempo.
3. Click on the desired Edit Template to select it and then click the **CREATE** button.

NOTE: If this is your first time selecting a GoPro Edit Template, the EDIT Tutorial will appear. The EDIT Tutorial gives you a brief walkthrough of how to use the Edit Templates in the EDIT Room.

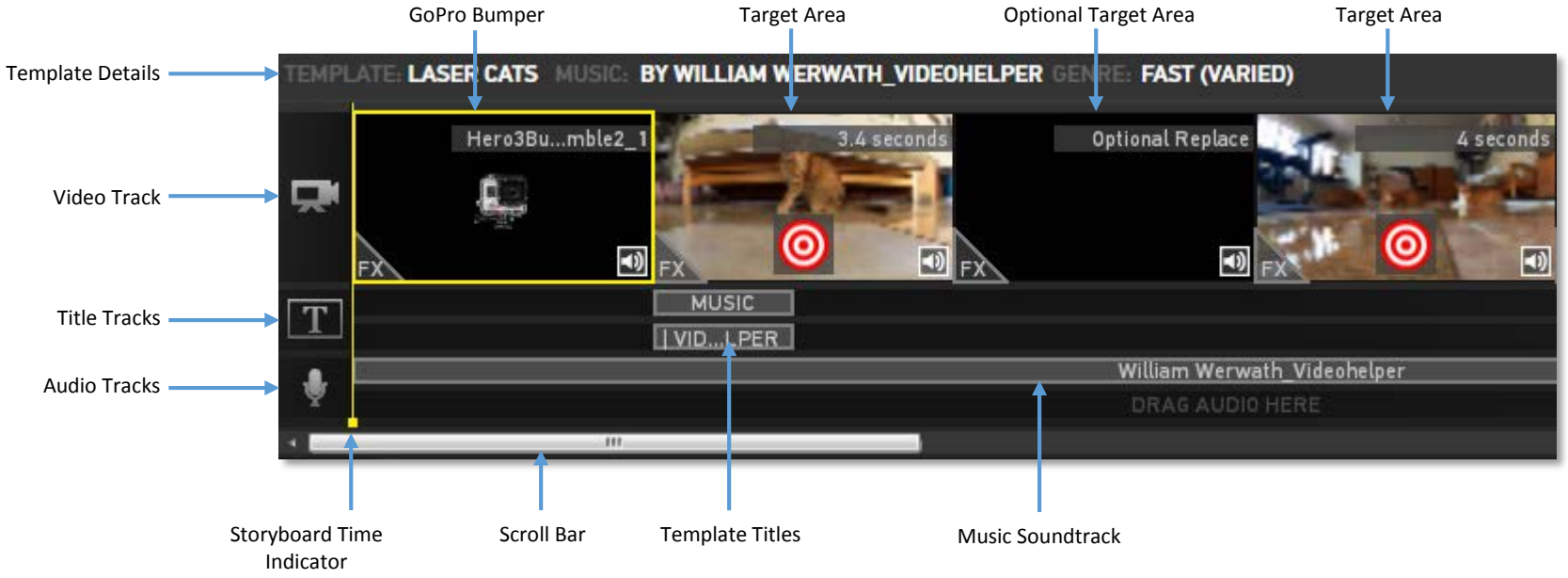
At this point GoPro Studio should have populated the Storyboard with the Edit Template that you chose.

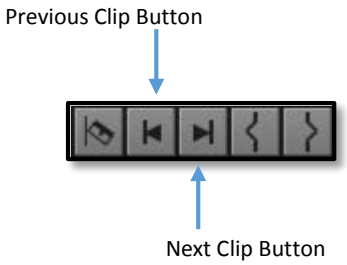
Identifying GoPro Edit Template Elements

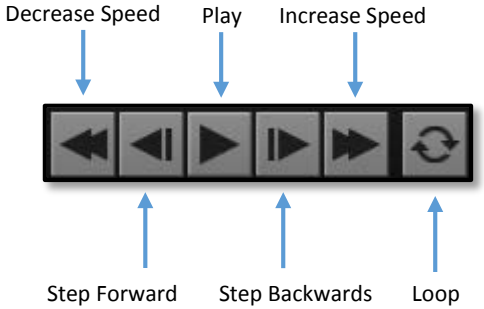
When loaded, the GoPro Edit Template,places sample content onto the Storyboard consisting of the following elements:

- **GoPro Bumpers** These remain at the front and the end of the Storyboard
- **Target Area**s You'll need to replace these elements with your own video clips before exporting
- **Optional Replacement Areas** You can optionally replace these with your video clips
- **Template Titles** You can move these to new locations on the storyboard or delete them entirely
- **Audio T**his element is locked in place and provides the template's music soundtrack

Each of the Target Areas are synced to the music soundtrack and locked in place on the Storyboard. While you can't change their duration or position, all other aspects (frames to show, speed, color, framing, etc.) are under your creative control.







Use the Scroll bar at the bottom of the Storyboard window to access portions of the Storyboard that go past the borders of the Storyboard window.

The Navigation Controls allow you to cycle forward and backwards through each Edit Template element on the Storyboard.

- Use the **Previous Clip** button to move to the previous element.
- Use the **Next Clip** button to move to the next element.

Viewing a GoPro Edit Template in the Player Window

Before you begin replacing the GoPro Edit Template content with your own video clips, it's a good idea to playback the Storyboard a few times to get a feel for the flow of the Edit Template.

- Click on a clip in the Storyboard and then drag the Storyboard Time Indicator to the beginning of the Storyboard and press the **PLAY** button in the Playback Controls (or the SPACEBAR on your keyboard) to see the all clips played back sequentially.
- The **Decrease Speed** and **Increase Speed** buttons can be used to play the video faster or slower.
- Use the **Step Forward** and **Step Backwards** buttons to step through the Storyboard one frame at a time.
- Press the **LOOP** button to cause playback to start over from the beginning when the Play-head reaches the end of the Storyboard.

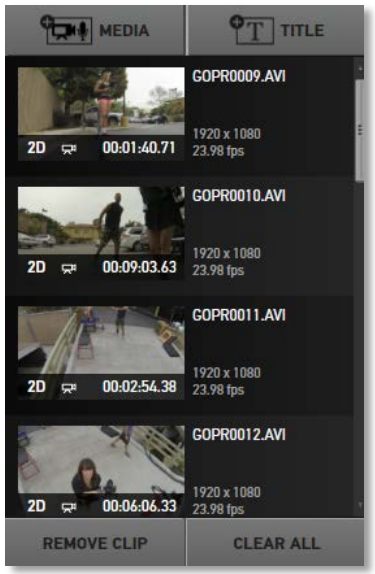
Tip: As you play through the GoPro Edit Template, pay particular attention to its use of slow-paced scenes and high-action scenes. This is important because when replacing these Target Areas with your own video clips, you'll want to match the energy level of the content you're replacing. This will ensure that your edits line up with the existing musical cues in the Edit Template's soundtrack.

Once you have a good feel for the flow of the GoPro Edit Template, you're ready move on to the next section, where you'll learn how to replace the Target Areas with your own video clips.

Previewing Clips in the Player Window

If you recently converted files in the IMPORT Room and pressed the **PROCEED TO STEP 2** button, you should see your converted GoPro CineForm files in the Media Bin on the left-hand side of the work area. If you don't see any files in the Media Bin, refer to the steps below.

1. Click the **ADD MEDIA** button and browse to the location of your converted GoPro CineForm files.
2. Highlight the files you wish to import and click **Open**.
3. After the files have loaded into the Media Bin, press 'Ctrl+S' on your keyboard to save your project.



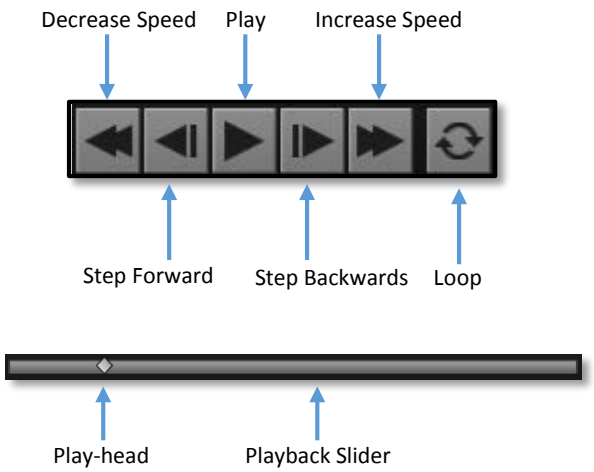
Clips loaded into the Media Bin are represented as thumbnails, similar to how they look in the Import Bin in the IMPORT Room. Along with each thumbnail, the following clip details are indicated:

- **Filename**
- **Image Size**
- **Frame rate or Frame Count**
- **2D or 3D**
- **Video or Time-Lapse Icon**
- **Duration**

You can select clips in the Media Bin by clicking on them or by using the up and down arrow keys on your keyboard to cycle through them.

To remove a clip from the Media Bin, select the clip you wish to remove and click on the **REMOVE CLIP** button at the bottom of the Media Bin.

To remove all clips from the Media Bin, click the **CLEAR ALL** button at the bottom of the Media Bin.



Click on a clip in the Media Bin to select it. That loads it into the Player Window. Now you can use the Playback Controls to playback the clip and view it in the Player Window.

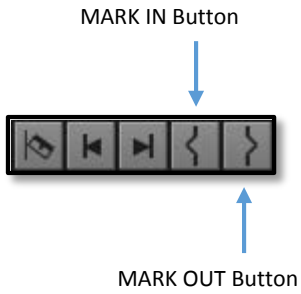
- Press the **PLAY** button in the Playback Controls (or the SPACEBAR on your keyboard) to see the clip playback in the Player Window.
- The **Decrease Speed** and **Increase Speed** buttons can be used to play the video faster or slower.
- Use the **Step Forward** and **Step Backwards** buttons to step through the clip one frame at a time.
- Press the **LOOP** button to cause playback to automatically start over from the beginning when the Play-head has reaches the end of the clip.

You can also use the Play-head on the Playback Slider to navigate through the clip. To do this, click on the diamond-shaped Play-head and drag left or right through the Playback Slider.

NOTE: This is called "scrubbing".

Replacing Target Areas With Your Video Clips

With your video clips loaded in the Media Bin, you're ready to start replacing GoPro Edit Template content on the Storyboard using the following steps:



1. Select the desired clip in the Media Bin.
2. Move the Play-head on the Playback Slider to the desired start location of your clip and press the **MARK IN** button to trim the beginning of the clip. The yellow IN Point marker will move to this position on the Playback Slider indicating the new start location. Don't worry about the OUT Point as we will address that later.
3. Click and drag the clip to the Storyboard and drop it onto the Target Area you wish to replace (a green box will highlight the Target Area indicating that an approved clip replacement is about to occur).
4. Optionally, click the **MUTE** button on the clip's thumbnail on the Storyboard to disable sound from the video clip.
5. Press 'Ctrl+S' to save your project.
6. Repeat these steps using the other video clips in your Media Bin (or different portions of the same clip) until each Target Area on the Storyboard has been replaced.

After a Target Area has been replaced, the "target" icon is removed and the thumbnail changes to represent the first frame of your video clip. At any time during this process, you can use the **PLAY** button to playback the Storyboard in the Player Window.

Refining Clips Within Target Areas

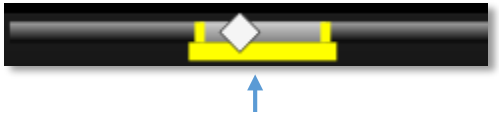
After replacing all the Target Areas with your own clips and playing back the Storyboard, you may discover that some of your clips don't quite fit in the Target Areas where you put them. This is actually to be expected as there is usually a pretty good chance that the edit points in your video clip are not the exact same length as the edit points in the Target Area, thus causing your clip to be cut short or last too long .

GoPro Studio helps you get around situations like this by using the following techniques:

- Moving the SEGMENT SLIDER BAR
- Adjusting the speed of the clip

Let's look at few situations where you might need to refine your clip in the Target Area.

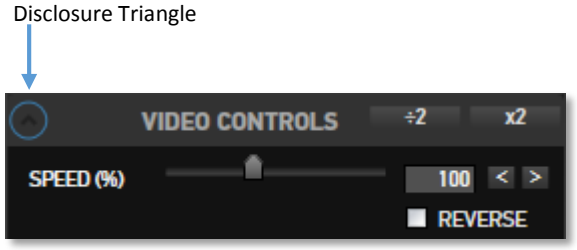
SITUATION #1



Segment Slider Bar

What if your clip gets cut off before the desired action of the clip is played? In order to fix this, you could do the following to slide the clip into place:

1. Select the clip on the Storyboard by clicking on it. A yellow border appears around the thumbnail of the selected clip.
2. Click and drag the Segment Slider Bar to the point where the desired action of the clip lies within the yellow area of the Segment Slider Bar or drag the Play-head to a new start or end point and click the **MARK IN** or **MARK OUT** buttons.



If the desired action is still too long to fit into the Target Area, you can use the VIDEO CONTROLS panel to speed up the clip to make it fit.

1. Make sure the clip is still selected on the Storyboard.
2. Click the **Disclosure Triangle** to the left of the words "VIDEO CONTROLS" on the right-hand side of GoPro Studio's EDIT Room.
3. Using the slider or text entry box, increase the speed to the point where the entire desired action of the clip fits into the length of the Target Area.

NOTE: Some experimentation will likely be required here to get achieve the desired results.

SITUATION #2

Now let's say that the desired action in your clip fits in the Target Area, but there is also an extra portion of the clip playing at the end that you did not wish to include. In order to fix this, you could use the VIDEO CONTROLS panel to slow down the clip.

1. Select the clip on the Storyboard.
2. Click the **Disclosure Triangle** to the left of the words "VIDEO CONTROLS" on the right-hand side of GoPro Studio's EDIT Room.
3. Using the slider or text entry box, decrease the speed to the point where the entire desired action in the video clip fits into the length of the Target Area.

NOTE: Some experimentation will likely be required here to achieve the desired results.

SITUATION #3

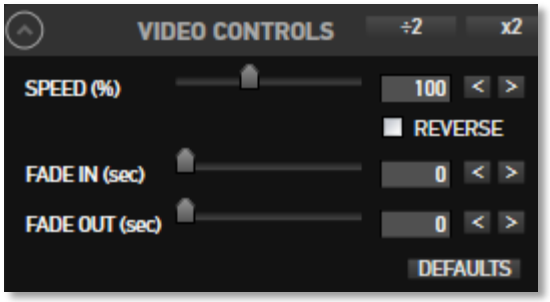
What if your clip is not long enough to fill a Target Area? When this happens, you will see a red box with an X in it as you hover over a Target Area with your shorter clip. In this situation you'll need to select a longer clip for this Target Area and drop this shorter clip onto a shorter Target Area.

At this point your Storyboard should be looking pretty good and it may actually be ready to export. However, there are many other enhancements that you can add to your Storyboard and/or individual clips to make it even more epic. Some of these enhancements are:

- Applying fades to video and audio clips
- Applying color and effect presets to video clips
- Adding additional titles or music to the Storyboard

The following sections of this user manual explain how to incorporate these additional features into your movie.

Disclosure Triangle



Adjusting Video Playback Settings

GoPro Studio lets you adjust certain parameters that determine how your video clip will playback on the Storyboard. You can change the speed of a clip or have it fade in or out.

To access these controls, select a clip in the Storyboard and then click the **Disclosure Triangle** to the left of the words “VIDEO CONTROLS” on the right-hand side of GoPro Studio’s EDIT Room. This will open up the VIDEO CONTROLS panel giving you access to the following settings:

- **SPEED** Use the slider or text entry box to select the speed (in percentage) at which the clip will be played back. 100% is normal speed, 50% is half speed, etc. Clicking the REVERSE checkbox causes the file to play in reverse at the chosen speed.
- **FADE IN** When used, this setting causes the selected clip to FADE IN from black. Use the slider or text entry box to select the duration (in seconds) of the FADE.
- **FADE OUT** When used, this setting causes the selected clip to FADE OUT to black. Use the slider or text entry box to select the duration (in seconds) of the FADE.

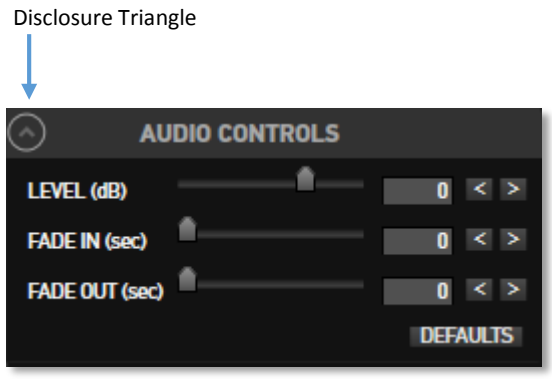
Click on the **DEFAULTS** button to reset all of the values in the VIDEO CONTROLS panel to their original settings. To reset the value or only one setting, double-click on the control itself. For example, to reset the SPEED value, double-click on the word ‘SPEED’.

Click on the **Disclosure Triangle** to close the VIDEO CONTROLS panel.

TIP: Next to the words VIDEO CONTROLS are two quick shortcut buttons that will adjust the playback speed of a clip. Click the ÷2 button to cause the clip to play at half its current speed. Click it a second time to half the speed again. Click the X2 button to cause the clip to play at double the current speed.

Adjusting Audio Playback Settings

If your video clip contains audio as well, GoPro Studio lets you adjust certain parameters that will determine how the audio portion will playback on the Storyboard.



To access these controls, select a clip in the Storyboard and then click the **Disclosure Triangle** to the left of the words “AUDIO CONTROLS” on the right-hand side of GoPro Studio’s EDIT Room. This will open the AUDIO CONTROLS panel giving you access to the following settings:

- **LEVEL** Use the slider or text entry box to select the volume level (in dB) at which the clip will be played back.
- **FADE IN** This setting causes the selected clip to FADE IN from silence. Use the slider or text entry box to select the duration (in seconds) of the FADE.
- **FADE OUT** When used, this setting causes the selected clip to FADE OUT to silence. Use the slider or text entry box to select the duration (in seconds) of the FADE.

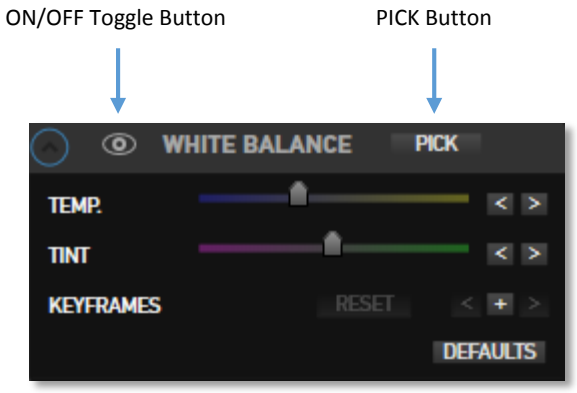
Click on the **DEFAULTS** button to reset all of the values in the AUDIO CONTROLS panel to their original settings. To reset the value or only one setting, double-click on the control itself. For example, to reset the LEVEL value, double-click on the word ‘LEVEL’.

Click on the **Disclosure Triangle** to close the AUDIO CONTROLS panel.

TIP: To completely disable the audio from a Video Clip, click on the AUDIO MUTE button in the clip’s thumbnail.

Color Correcting Clips

The underlying Active Metadata™ architecture used in the GoPro CineForm codec enables you to do real-time non-destructive image development adjustments to your clips. These adjustments affect the overall color and tone of your clips. The controls to apply these adjustments are located in the WHITE BALANCE and IMAGE CONTROLS panels on the right-hand side of GoPro Studio's EDIT Room.



WHITE BALANCE

Select a clip on the Storyboard and then click on the **Disclosure Triangle** to the left of the words "WHITE BALANCE" to open the WHITE BALANCE panel giving you access to the following settings:

- **TEMP** Use the slider or step controls to adjust the overall temperature of the image.
- **TINT** Use the slider or step controls to adjust the overall tint of the image.
- **KEYFRAMES** For advanced users, the white balance settings can be keyframed. Use the + button to add a white balance keyframe to the clip. This locks in the white balance settings for the current frame on the Storyboard. You can then move the Play-head to another location on the Playback Slider to add another keyframe where you can have different white balance settings. This is a great way to have the white balance settings change over the duration of the clip.

For a clip with a white element in the scene, click on the **PICK** button and then click on the white element of your image in the Playback Window to have GoPro Studio automatically adjust the white balance based on that element.

Click on the **DEFAULTS** button to reset all of the values in the WHITE BALANCE panel to their original settings. Double-click on an individual Control to reset only its value.

Click on the **Disclosure Triangle** to close the WHITE BALANCE panel.

TIP: Clicking on the ON/OFF Toggle button (which looks like an eyeball) will toggle the WHITE BALANCE adjustments ON or OFF for the selected clip on your Storyboard. You can use this to quickly switch back and forth between seeing the clips with the adjustments applied and the original images.

ON/OFF Toggle Button

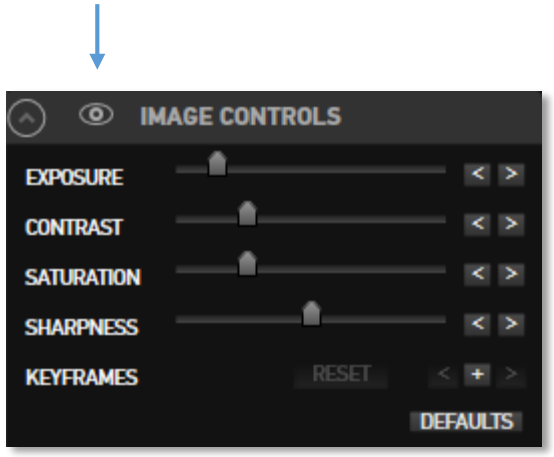


IMAGE CONTROLS

Select a clip on the Storyboard and then click on the **Disclosure Triangle** to the left of the words “IMAGE CONTROLS” to open the IMAGE CONTROLS panel giving you access to the following settings:

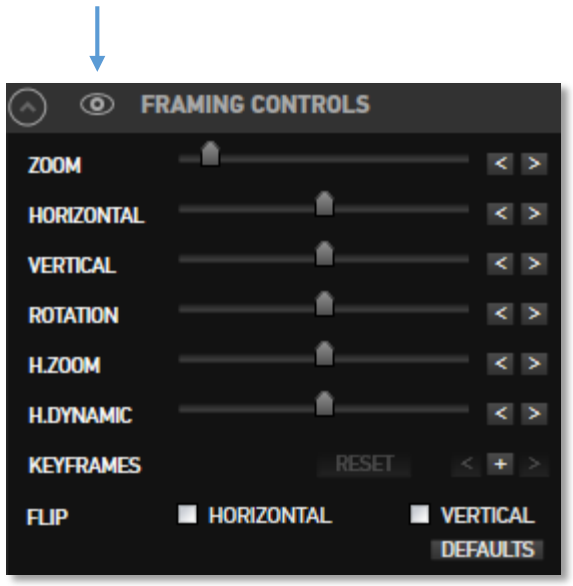
- **EXPOSURE** Use the slider or step controls to adjust the brightness and darkness of the image.
- **CONTRAST** Use the slider or step controls to adjust the relative definition between bright and dark areas of the image.
- **SATURATION** Use the slider or step controls to adjust the vibrancy of the colors in the image.
- **SHARPNESS** Use the slider or step controls to adjust the softness and sharpness of the image.
- **KEYFRAMES** For advanced users, the image control settings can be keyframed. Use the + button to add a white balance keyframe to the clip. This locks in the image control settings for the current frame on the Storyboard. You can then move the Play-head to another location on the Playback Slider to add another keyframe where you can have different image control settings. This is a great way to have the image control settings change over the duration of the clip.

Click on the **DEFAULTS** button to reset all of the values in the IMAGE CONTROLS panel to their original settings. Double-click on an individual Control to reset only its value.

Click on the **Disclosure Triangle** to close the IMAGE CONROLS panel.

TIP: Clicking on the ON/OFF Toggle button (which looks like an eyeball) will toggle the IMAGE CONTROLS adjustments ON or OFF for the selected clip on your Storyboard. You can use this to quickly switch back and forth between seeing the clips with the adjustments applied and the original images.

ON/OFF Toggle Button



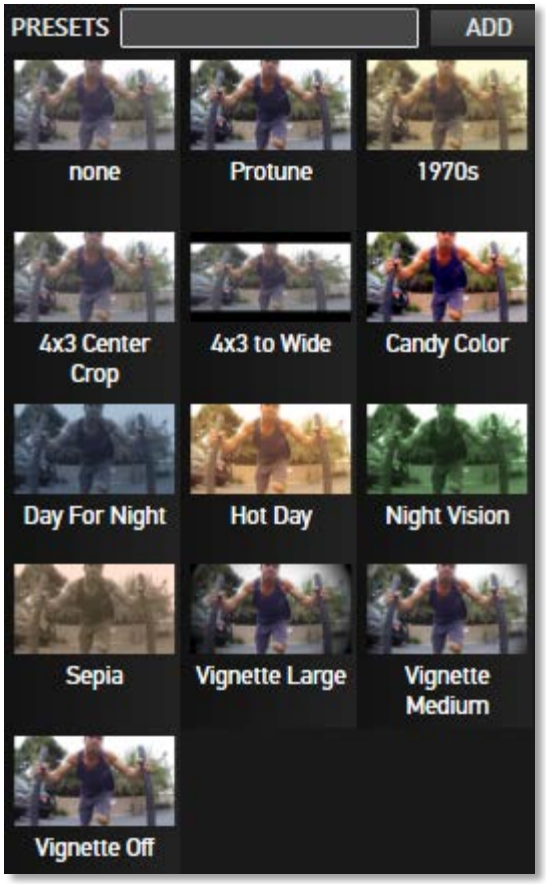
Framing Clips

The FRAMING CONTROLS allow you to change the composition of your clips. Select a clip on the Storyboard and then click on the **Disclosure Triangle** to the left of the words "FRAMING CONTROLS" to open the FRAMING CONTROLS panel giving you access to the following settings:

- **ZOOM** When you want to get closer to the subject in your video, use the slider or step controls to adjust scale of the image.
- **HORIZONTAL** Use the slider or step controls to adjust the horizontal location
- **VERTICAL** Use the slider or step controls to adjust the vertical location
- **ROTATION** Use the slider or step controls to slightly rotate the clip.
- **H.ZOOM** When mixing 4x3 and 16x9 video sources, use this slider or step controls to adjust the horizontal scaling of the image.
- **H.DYNAMIC** Use this slider or step controls to adjust the horizontal stretch point of the image. This control is best used in tandem with the H.ZOOM control and helps preserve the normal look of people if they have been stretched by 4x3 to 16x9 conversion.
- **KEYFRAMES** For advanced users, the framing controls can be keyframed. Use the + button to add a framing keyframe to the clip. This locks in the framing control settings for the current frame. You can then move the Play-head to another location to add another keyframe where you can have different framing control settings.
- **FLIP** Use the check boxes to enable or disable horizontal or vertical flipping on the image. Enable both of these options if you shot your scene upside-down.

Click on the **DEFAULTS** button to reset all of the values in the FRAMING CONTROLS panel to their original settings. Double-click on an individual Control to reset its value.

Click on the **Disclosure Triangle** to close the FRAMING CONTROLS panel.
TIP: Clicking on the ON/OFF Toggle button (which looks like an eyeball) will toggle the FRAMING CONTROLS adjustments ON or OFF for the selected clip on your Storyboard. You can use this to quickly switch back and forth between seeing the clips with the framing adjustments applied and the original images.



Applying Effect Presets

In GoPro Studio's EFFECT PRESETS panel, you can choose from several pre-made color and vignette effects and apply them to your clips on the storyboard. This is a quick and easy way to make your clips look more dynamic. Select a clip on the Storyboard and then click on one of the following EFFECT PRESETS to apply it to the clip:

- **NONE** resets all Color Correction and Framing adjustments to their defaults.
- **PROTUNE** applies a saturation and contrast adjustment to footage shot in the Protune mode making it look more 'punchy' (applied automatically to Protune enabled clips).
- **1970S** applies a warm color effect that simulates film shot in the 1970s.
- **4X3 CENTER CROP** zooms in on a clip shot with a 4x3 aspect ratio while cropping the top and bottom portions of the image.
- **4X3 TO WIDE** applies a combination of framing adjustments to transform a clip shot in 4x3 aspect ratio to a 16:9 image.
- **CANDY COLOR** applies a highly saturated color effect to the clip.
- **DAY FOR NIGHT** applies a color effect that simulates footage that was shot at night.
- **HOT DAY** applies a warm color effect that simulates being close to the sun.
- **NIGHT VISION** applies a green tint over the image simulating an infrared look that you see when using night vision goggles.
- **SEPIA** applies a brownish and unsaturated effect to achieve a sepia tone look.
- **VIGNETTE LARGE** applies a large vignette to the image.
- **VIGNETTE MEDIUM** applies a medium-sized vignette to edges of the image.
- **VIGNETTE OFF** applies a small vignette to the edges of the image.

To create your own PRESET, do the following:

1. Select a video clip on the Storyboard.
2. Use the WHITE BALANCE, IMAGE CONTROLS and FRAMING CONTROLS to dial in your own custom look.
3. Type a name for the new preset in the text box next to the word PRESET in the PRESET panel.
4. Click on the **ADD** button.

Press the **RESET ALL** button to return all of the WHITE BALANCE, IMAGE CONTROLS, FRAMING CONTROLS and EFFECT PRESETS applied on a clip to their default values. Or click and drag the FX icon on the clip's thumbnail off the top of the Storyboard.

Copying Settings from One Clip to Another

If you're happy with the look of a particular clip and want to apply those same settings to another clip, you can easily accomplish this by doing the following:

1. Click on the FX icon on clip that has the settings you want to copy to other clips.
2. Right-click on the FX Icon and elect "Copy" from the context menu that is displayed (or press 'Ctrl+C' on your keyboard).
3. Click on the FX icon on the clip where you want to copy the settings to.
4. Right-click on the FX Icon and select "Paste" from the context menu that is displayed (or press 'Ctrl+V' on your keyboard).
5. Continue pasting these settings on any additional clips by repeating steps 4 and 5 above.

To remove the settings from a clip, right-click on the FX Icon and select "Cut" from the context menu that is displayed.

NOTE: The Copy and Paste functions are for transferring Color Correction, Framing and Preset Effects to other clips. However, Video and Audio Playback Settings, cannot be copied from one clip to another.

Adding Music or Sound Effects

To enhance your movie, GoPro Studio allows you to add additional audio files to the Storyboard. The audio formats currently supported by GoPro Studio are:

- mp3
- wav
- aiff
- m4a
- caf.

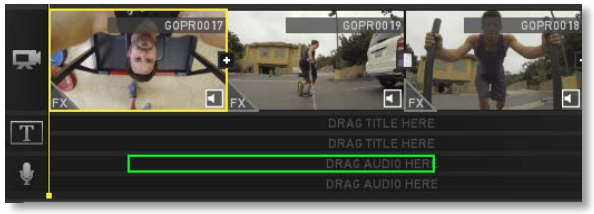
To add an audio file, you must first import it into the Media Bin.

1. Click the **ADD MEDIA** button at the top of the Media Bin.
2. Browse to the location of your audio file.
3. Highlight the audio file and click **Open**.

After importing an audio file, its thumbnail (a microphone on a music staff) will appear in the Media Bin. From here you can add it to your Storyboard by doing the following:

1. Scroll through the Media Bin to find the audio file that you'd like to add.
2. Click and drag the file from the Media Bin to the audio track that does not already contain the Edit Template's music soundtrack.
3. Repeat these steps to add additional audio files to the Storyboard

As you drag audio files to the Storyboard, GoPro Studio uses a green box to indicate the spot where the file will be inserted. This makes it easier for you to line up the audio file with other portions of your Storyboard. The box will grow or shrink in size depending on the length of the video clips under which the audio file is being placed.



TIP: Dragging an audio file directly on top of an existing video clip will cause the audio file to start at the same time as that video clip.

After placing an audio file, you can rearrange it by selecting it and dragging it to a new location. You can shorten or lengthen the audio file by clicking and dragging its edges. You can remove an audio file from the Storyboard by selecting it and pressing the 'DELETE' key on your keyboard or by dragging it off the top of the Storyboard.

When an audio file is selected on the Storyboard, the AUDIO PROPERTIES appear in the Control Panel (on the right-hand side of GoPro Studio's EDIT Room) giving you access to the following settings:

- **LEVEL** Use the slider or text entry box to select the volume level (in dB) at which the clip will be played back.
- **FADE IN** When used, this setting causes the selected clip to FADE IN from silence. Use the slider or text entry box to select the duration (in seconds) of the FADE.
- **FADE OUT** When used, this setting causes the selected clip to FADE OUT to silence. Use the slider or text entry box to select the duration (in seconds) of the FADE.

Click on the **RESET ALL** button to reset all of the values in the AUDIO PROPERTIES panel to their original settings. To reset the value or only one setting, double-click on the control itself. For example, to reset the LEVEL value, double-click on the word 'LEVEL'.

TIP: To disable the existing audio from a Video Clip, click on the AUDIO MUTE button in the clip's thumbnail. This is a good way to keep it from interfering with your new audio file.

Adding Titles

MARK OUT Button

OUT Point Marker

To further enhance your movie, GoPro Studio lets you add titles to your Storyboard. When using a GoPro Edit Template, you can add titles to either of the two Title Tracks. When adding a title to one of the Title Tracks, the title will be superimposed over the video clip or clips that appear directly above it on the Storyboard.

To add a title to your Storyboard, do the following:

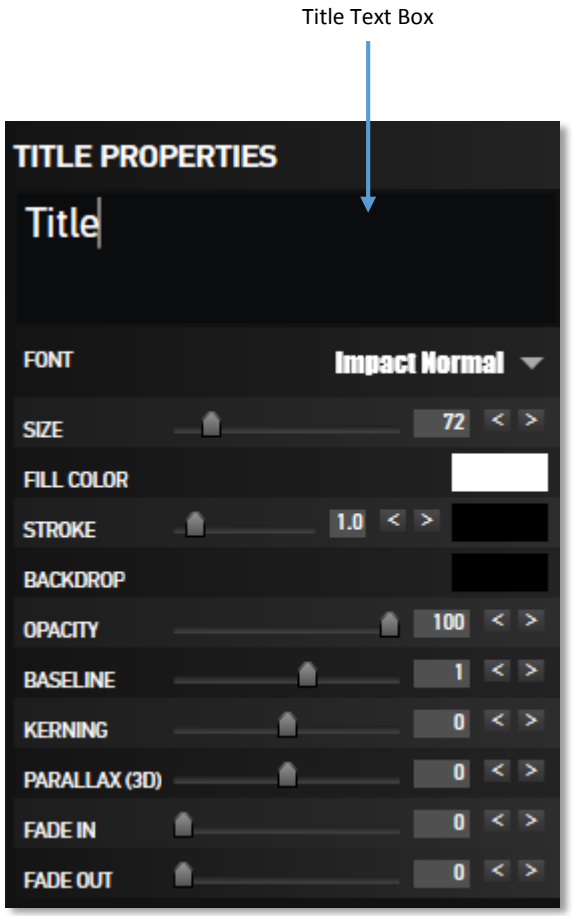
1. Click the **ADD TITLE** button at the top of the Media Bin. A thumbnail representing the title will appear in the Media Bin with the word “Title” on it.
2. Now click and drag the title from the Media Bin to the Storyboard at the desired location on one of the two Title Tracks.

As you drag a title to a Title Track on the Storyboard, GoPro Studio uses a green box to indicate the spot where the title will be inserted. This makes it easier for you to line up the title with other portions of your Storyboard. The box will grow or shrink in size depending on the length of the video clips under which the audio file is being placed.

To adjust the duration of a title on a Title Track, do the following:

1. Select the title on the Storyboard. You’ll know it’s selected by the yellow box surrounding it.
2. Click and drag the left or right edges of the yellow box surrounding it to lengthen or shorten the title. You can also set a new out point for the title by clicking the **MARK OUT** Button or moving the OUT Point marker on the playback slider to a new end point.

To move a title earlier or later in time, simply click and drag it to a new location on the Storyboard.



To change the text in this title, do the following:

1. Select the title on the Storyboard.
2. Type the new text in the TEXT Box in the TITLE PROPERTIES panel on the right-hand side of GoPro Studio's EDIT Room.

The TITLE PROPERTIES panel also lets you adjust the following attributes of your title:

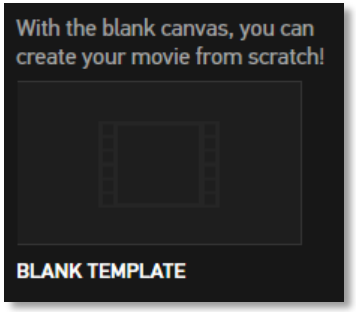
- **FONT** Changes the font used in the text.
- **SIZE** Adjusts the size of the font used.
- **FILL COLOR** Changes the color of the font.
- **STROKE** Changes the color, style, transparency and thickness of the outline on each letter.
- **BACKDROP** Changes the background color.
- **OPACITY** Changes the transparency of the text.
- **BASELINE** Adjusts the line spacing between lines when there are multiple lines of text.
- **KERNING** Adjusts the spacing between letters.
- **PARALLAX** Adjusts the closeness or farness of the text in 3D space.
- **FADE IN** Changes the Fade In of the Title (in seconds).
- **FADE OUT** Changes the Fade Out of color, use the Title (in seconds).

When a title is selected on the Storyboard, you can choose from one of several Title Presets by clicking on a preset thumbnail in the PRESET panel.

Last, but certainly not least, to place the title where you want it to appear in horizontal and vertical space in the Player Window, do the following:

1. Select the title in the Storyboard.
2. Click and drag the title in the Player Window to move it to the desired horizontal and vertical location.

Creating your Own Edit Using a Blank Template

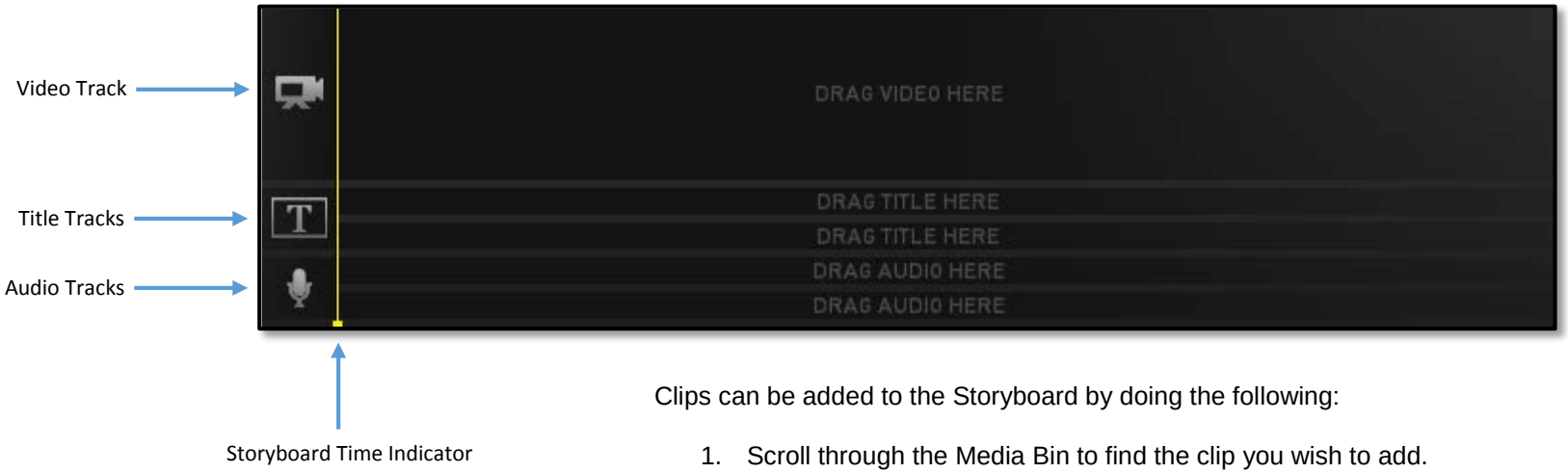


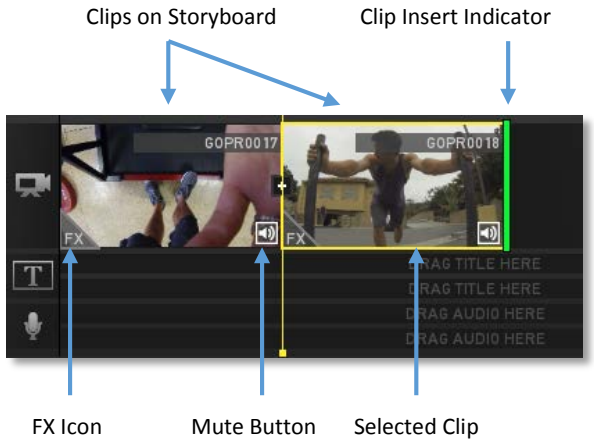
Once you've mastered the art of using GoPro Edit Templates, you might feel the need to get even more creative and create your own edit. In the **Browse Edit Templates** window, select the "BLANK TEMPLATE" option and then click the **CREATE** button or just click the **CANCEL** button. This will allow you to create your own edit from scratch starting with a blank Storyboard rather than a GoPro Edit Template.

At this point, you should already see your converted GoPro CineForm files in the Media Bin on the left-hand side of the work area. If you don't see any files in the Media Bin, refer to the instructions in the "Previewing Clips in the Player Window" section in the previous chapter.

Adding Clips to the Storyboard

The Storyboard portion of GoPro Studio's EDIT Room allows you to combine multiple clips into one compelling video. The Storyboard is located directly underneath the Preview Window and Playback Controls and consists of 1 Video Track, 2 Audio Tracks and 2 Title Tracks.





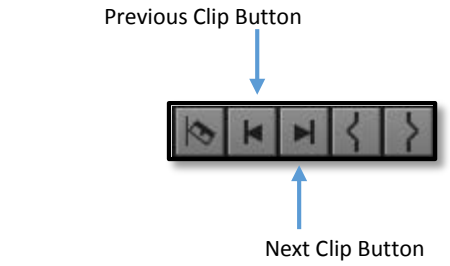
Clips can be added to the Storyboard by doing the following:

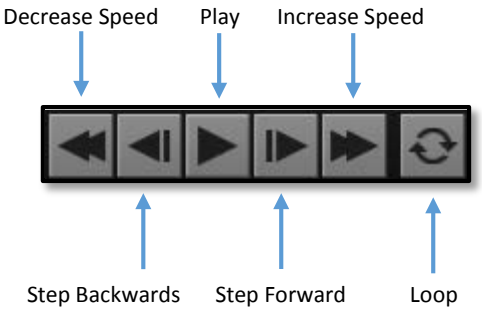
1. Scroll through the Media Bin to find the clip you wish to add.
2. Click and drag the clip's thumbnail to the video track on the Storyboard.
3. Repeat these steps to add more clips to the Storyboard.
4. Press 'Ctrl+S' to save your project.

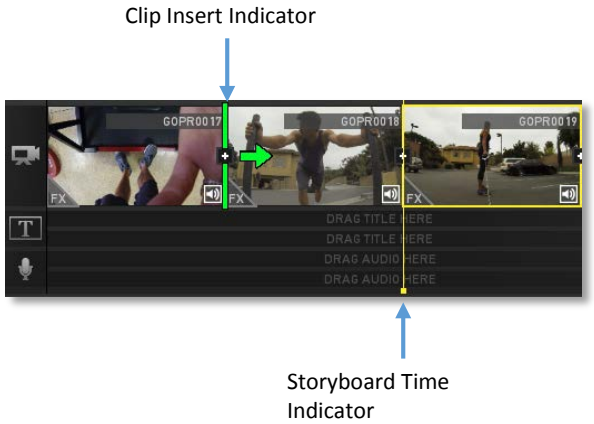
Clips on the Storyboard are represented as thumbnails. A yellow border around the thumbnail indicates the selected clip. The thumbnails also include:

- **Filename**
- **FX Icon** (click and drag this off the top of the Storyboard to remove all Color Correction, 3D Convergence and Framing adjustments)
- **Audio MUTE Button** (click on this to toggle audio on and off for the selected clip)

As you drag video clips to the Storyboard, GoPro Studio uses a vertical green line to indicate the spot where the clip will be inserted. This makes it easier for you to know if your clips are being inserted between other clips or appended to the end of the storyboard.







The Navigation Controls allow you to cycle forward and backwards through each edit point on the Storyboard.

- Use the **Previous Clip** button to move to the previous edit point.
- Use the **Next Clip** button to move to the next edit point.

Viewing the Storyboard in the Player Window

The same Playback Controls used to playback clips in the Media Bin are used to control playback of the Storyboard.

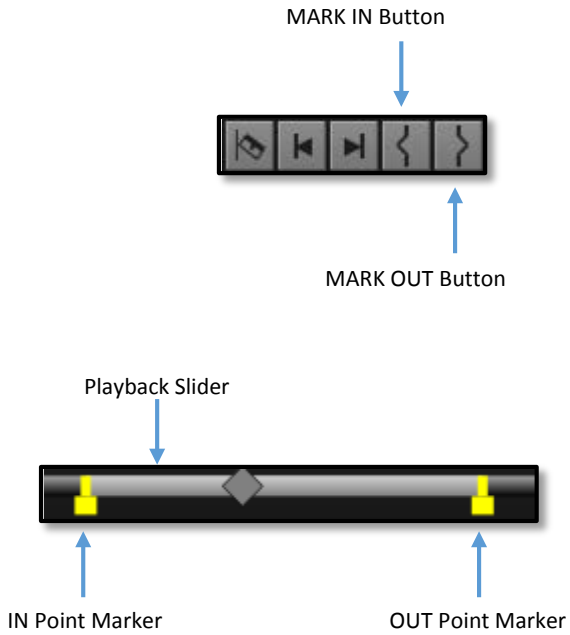
- Click on a clip in the Storyboard and then press the **PLAY** button in the Playback Controls to see all the clips in the Storyboard played back in sequence.
- The **Decrease Speed** and **Increase Speed** buttons can be used to play the video faster or slower.
- Use the **Step Forward** and **Step Backwards** buttons to step through the Storyboard one frame at a time.
- Press the **LOOP** button to cause playback to start over from the beginning when the Play-head reaches the end of the Storyboard. Press it again to turn looping off.

You can also use the Storyboard Time Indicator (the vertical yellow bar) to navigate through the Storyboard. To do this, just click on the Storyboard Time Indicator and drag it left or right through the Storyboard.

Rearranging Clips

You can rearrange clips on the Storyboard by clicking and dragging them to new locations. Once again, a vertical green line indicates the spot where the clip is being moved to. You can delete a clip, by selecting it and pressing the ‘DELETE’ key on your keyboard or by dragging it off the top of the Storyboard.

When you’re done rearranging your clips, press the **PLAY** button in the Playback Controls to confirm that the clips are in the desired order. If so, press ‘Ctrl+S’ to save your project—it’s a good idea to save your project periodically.



Trimming Clips

There will likely be situations where you don't want to use the entire clip on your Storyboard. Fortunately, GoPro Studio makes it easy for you to trim clips before or after moving them to the Storyboard.

Trimming Clips in the Media Bin

To trim a clip prior to adding it to the Storyboard, do the following:

1. Select the desired clip in the Media Bin.
2. Move the Play-head on the Playback Slider to the desired start location of your clip and press the **MARK IN** button to trim the beginning of the clip. The yellow IN Point marker will move to this spot on the Playback Slider indicating the new start location.
3. Now move the Play-head to the desired end location of your clip and press the **MARK OUT** button to trim the end of the clip. The yellow OUT Point marker will move to this spot on the Playback Slider indicating the new end location.
4. Drag the clip to the Storyboard.
5. Repeat these steps if you wish to add multiple portions of the same file to the Storyboard.

TIP: Dragging the yellow IN and OUT POINT markers to new locations along the Playback Slider will also trim the IN and OUT points. You might find this to be a quicker method for trimming clips.

Trimming Clips on the Storyboard

To trim a clip after it has been added to the Storyboard, do the following:

1. Select the clip you wish to trim on the Storyboard. Move the Play-head on the Playback Slider to the desired start location of your clip and press the **MARK IN** button to trim the beginning of the clip.
2. Now move the Play-head to the desired end location of your clip and press the **MARK OUT** button to trim the end of the clip.

TIP: Alternatively, you can drag the yellow IN and OUT POINT markers to new locations to set new IN and OUT Points for the clip.

SPLIT Button

Splitting Clips

After dragging some clips to the Storyboard, you may find yourself in a situation where you want to insert a clip in the middle of another clip. To do this, you can use the **SPLIT** button.

1. Move the Play-head or the Storyboard Time Indicator to the location where you would like to insert the new clip.
2. Press the **SPLIT** button to split the clip in two.
3. Drag the new clip between the two split clips.

*TIP: If you position the Play-head at the first frame of a clip, clicking the **SPLIT** button will split the clip in half.*

Adding Transitions

When playing back your Storyboard, the default transition between two clips is a 'CUT'. You have the option, however of using a 'DISSOLVE' instead.

To change the transition from a 'CUT 'to a 'DISSOLVE', do the following:

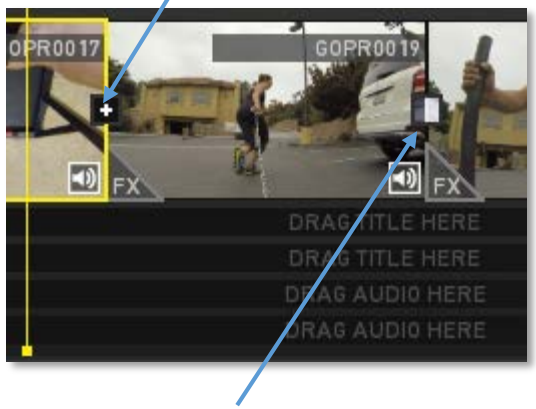
1. On the Storyboard, click the **ADD TRANSITION** icon (+ sign) between the two clips where you'd like to add the dissolve. Once added, the + sign will change to a new icon, indicating that it is now a 'DISSOLVE'.
2. Move the Storyboard Time Indicator to a couple of seconds behind the transition point and press the **PLAY** button to see that the new transition has been applied.

To change the duration of a 'DISSOLVE', click on the Dissolve Icon to select it. Then move the Play-head to the desired out point on the Playback Slider and press the M**ARK OUT** button or move the OUT Point Marker to a new position on the Playback Slider.

To remove a 'DISSOLVE', click and drag the Dissolve Icon off the top of the Storyboard or select it and press the 'DELETE' key on your keyboard.

NOTE: Transitions use frames from the end of the first clip and the beginning of the following clip. The number of frames used depends on the duration of the transition. The number of frames in the transition cannot exceed the number of frames in the shortest clip.

Add Transition Icon



Dissolve Icon

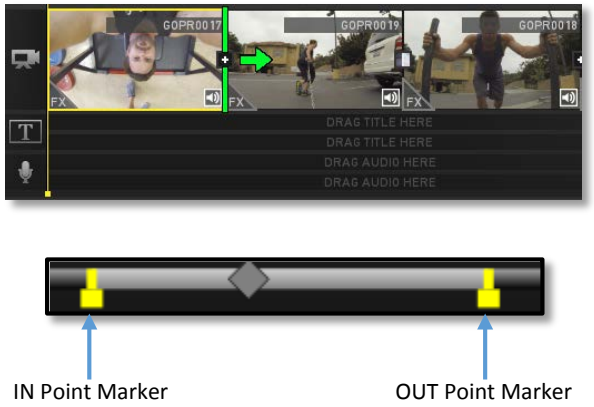
Additional Enhancements

You can further enhance the clips on your Storyboard by using the features mentioned in the "Using GoPro Edit Templates" section of this user manual. These include the video and audio playback controls, color-correction and framing controls, and the ability to add color and effect presets, titles and audio files. For the most part, you can refer to the specific instructions mentioned previously but there are a couple of things to note in regards to adding titles and audio files.

Adding Music

When using a GoPro Edit Template, one of the Audio Tracks is used up by the template's music soundtrack so you only have one Audio Track available for additional audio files. When using a Blank Template, however, you have the ability to add audio files to either of the two Audio Tracks because there is no existing music soundtrack.

Adding Titles



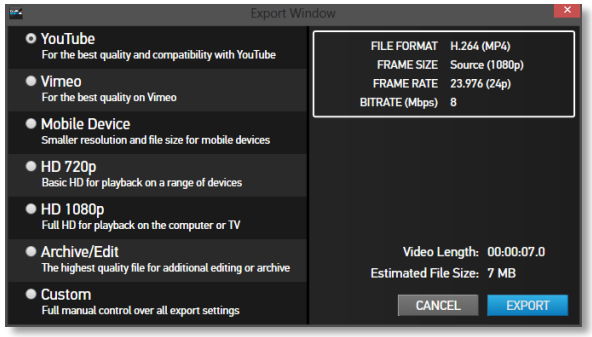
In addition to being able to add titles to one of the two available Title Tracks, when using a Blank Template you can add titles directly to the Video Track as well.

As you drag a title to the Video Track. GoPro Studio uses a vertical green line to indicate the spot where the title will be inserted.

To adjust the duration of a title on the Video Track, select the title and drag the yellow OUT POINT markers on the Playback slider to lengthen or shorten the title.

To move a title earlier or later in time, simply click and drag it to a new location on the Storyboard.

Step 3: EXPORT


Export Window
YouTube
For the best quality and compatibility with YouTube
Vimeo
For the best quality on Vimeo
Mobile Device
Smaller resolution and file size for mobile devices
HD 720p
Basic HD for playback on a range of devices
HD 1080p
Full HD for playback on the computer or TV
Archive/Edit
The highest quality file for additional editing or archive
Custom
Full manual control over all export settings
FILE FORMAT H.264 (MP4)
FRAME SIZE Source (1080p)
FRAME RATE 23.976 (24p)
BITRATE (Mbps) 8
Video Length: 00:00:07.0
Estimated File Size: 7 MB
CANCEL
EXPORT

When you're done editing your Storyboard and are happy with how it looks, you'll want to share it with the world. With GoPro Studio you can export your completed Storyboard (combining all the video clips, titles and audio tracks into a single file) using one of the standard export options designed for specific target distribution outlets, or you can create your own custom export settings. You can also export single frames of your video clips or Storyboard.

Exporting a Movie

To access the Export Window, click on a clip on the storyboard to make sure the Storyboard is selected rather than a clip in the Media Bin. Then do one of the following:

- Click on the **EXPORT** button at the top of GoPro Studio's work area
- Select the **'Export Movie…'** option from the **FILE** menu
- Or click 'Ctrl+E' on your keyboard

In the Export Window you can choose from any of the following export options:

- **YouTube** (creates an average quality mp4 file with a bit rate of 8Mbps)
- **Vimeo** (creates an above average quality mp4 file with a bit rate of 15Mbps)
- **Mobile Device** (creates a low quality .mp4 file with a bit rate of 2Mbps)
- **HD 720p** (creates an average quality mp4 file with a 720p frame size and a bit rate of 8Mbps)
- **HD 1080p** (creates an above average quality mp4 file with a 1080p frame size and a bit rate of 15Mbps)
- **Archive/Edit** (creates a GoPro CineForm AVI or MOV file using user-selectable quality level)
- **Custom** (lets the user choose the format, frame size, frame rate and quality settings)

When clicking on the "Custom" option, the previously selected preset's settings become the starting point for customization.

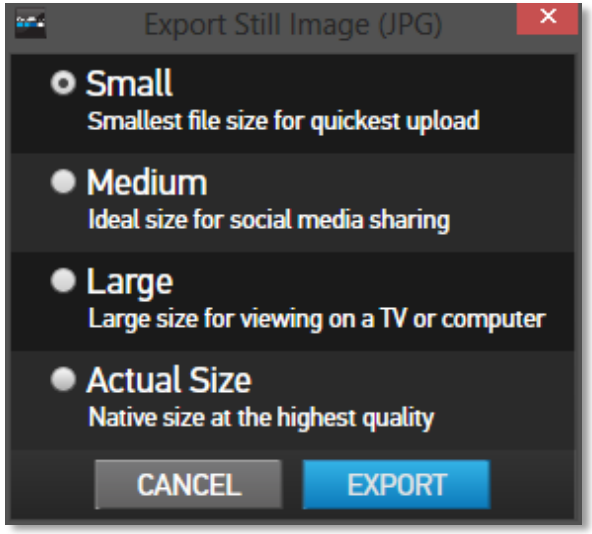
NOTE: The default frame rate for an export is determined by the frame rate used by the majority of the clips on the Storyboard. Exporting to frame rates above 30 fps is not

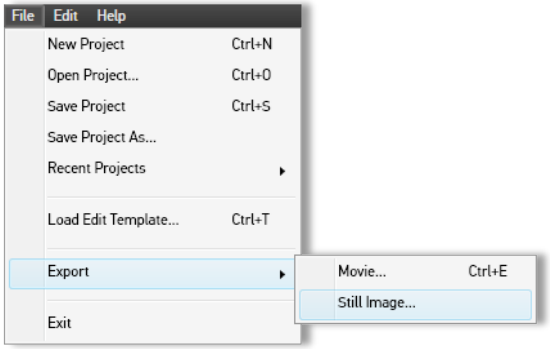
recommended if you wish to retain compatibility with modern electronic devices and streaming services..

Select the export preset that best meets the needs for your project and distribution outlets and then do the following:

1. Browse to the desired folder location and type a filename in the ‘File name’ box.
2. Click **SAVE** to start the export process.
3. A progess bar will appear giving you an idea of how long the export will take.

NOTE: Exporting may take a few minutes or even longer depending on the length of your Storyboard and the speed of your computer’s processor.





Exporting Still Images

In addition to being able to export your Storyboard, GoPro Studio also lets you export a single frame (in JPG format) from a clip or the Storyboard. This enables you to share images from your video clips as though they were still photos. Exporting still images out of GoPro Studio is done using the Export Image Window, which can be accessed by selecting the **'Export Still image…'** command in the **FILE** menu.

In the Export Still Image Window you can choose from any of the following export options:

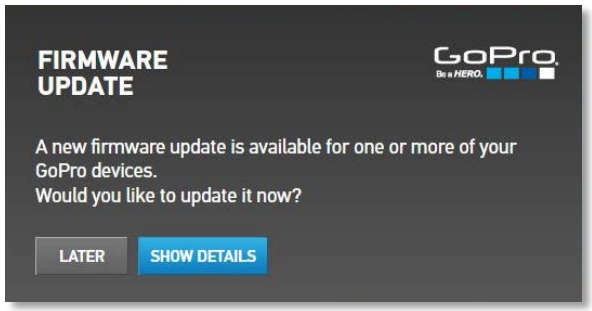
- **Small** (creates a file with an image size of 853 x 480)
- **Medium** (creates a file with an image size of 1280 x 720)
- **Large** (creates a file with an image size of 1920 x 1080)
- **Actual Size** (creates a file with the same image size as the source clip or Storyboard)

To export a still image, do the following:

1. Select a clip in the Media Bin or the Storyboard.
2. Click and drag the Play-head on the Playback Sider to the desired frame you'd like to export.
3. Select 'Export Still Image…' in the **FILE** menu.
4. In the Export Still Image Window, select the desired export size and click **EXPORT**.
5. Browse to the desired folder location and type a filename in the 'File name' box.
6. Then click **SAVE** to export the file.

Working with Devices

Device Window
REFRESH
HD HERO2
Please connect your HD HERO2 via USB.
Wi-Fi BacPac™
Please connect your Wi-Fi BacPac™ via USB.
Wi-Fi Remote
Please connect your Wi-Fi BacPac via USB and power on your Wi-Fi Remote.


FIRMWARE UPDATE
GoPro
A new firmware update is available for one or more of your GoPro devices.
Would you like to update it now?
LATER
SHOW DETAILS

GoPro Studio offers a way for you to update the product software in your HD HERO2 camera, Wi-Fi BacPac™ and Wi-Fi Remote. You can perform these tasks from within the Device Window, which you can access by selecting 'Device Window' from the **HELP** menu or by clicking on 'Ctrl+D' on your keyboard.

IMPORTANT NOTE: *This process is only for updating the HD HERO2, Wi-Fi BacPac and Wi-Fi Remote. To update an original HD HERO, click here. To update a HERO3, click here.*

Getting Started

- Make sure your HD HERO2, Wi-Fi BacPac and Wi-Fi Remote are fully charged before beginning update process.
- Make sure your HD HERO2 has an SD card inserted (format your SD card using your HD HERO2 camera, and take at least one test photo or video before initializing the update process).
- Remove any accessories (such as the LCD BacPac™ or Battery BacPac™) from your HD HERO2 camera.
- Make sure your GoPro Studio software is up-to-date. For updates, go to http://cineform.com/downloads.aspx
- Make sure your computer has an active connection to the internet.

Updating your HD HERO2

1. Without any BacPac accessories connected, power ON your HD HERO2 camera and connect it to your computer via USB.
2. Launch the GoPro Studio application. An Update Available notice will appear.
3. Press the **SHOW DETAILS** button, and this will launch the Device Window.
4. Select your HD HERO2 camera from the list, and click **UPDATE**.
5. Wait for the Update process to complete (camera may beep and lights will flash), and when process completes you may disconnect and power OFF your camera.

Registering Your Wi-Fi BacPac™

1. Power ON your HD HERO2 camera and connect your Wi-Fi BacPac (with power ON) to the back of your camera. Also power ON your Wi-Fi Remote.
2. With your Wi-Fi BacPac attached to your HD HERO2 camera, connect your Wi-Fi BacPac to your computer via USB (make sure to connect through the USB port on Wi-Fi BacPac, not the USB port on the HD HERO2 camera).
3. If another Update Available notice appears, you should click the **SHOW DETAILS** button again to get back to the Device Window.
4. Select your Wi-Fi BacPac from the list in Device Window in GoPro CineForm Studio, and click the **REGISTER** button.
5. Fill out and submit the Product Registration web form you are directed to.

Updating Your Wi-Fi BacPac

1. Back in the Device Window, the list should refresh and show an Update Available for your Wi-Fi BacPac.
2. Select your Wi-Fi BacPac from the list and click the **UPDATE** button if an update is available (a press of the Refresh button may be required for Device Window to update and confirm Product Registration is complete).
3. Wait for update process to complete. Up-to-date version will be reflected when Device Window refreshes, and your Wi-Fi Remote should now show Update Available.

Updating Your Wi-Fi Remote

1. After your Wi-Fi BacPac has been updated, your Wi-Fi Remote will show Connected (may require a press of the Refresh button at this point while devices reconnect after Wi-Fi BacPac update is completed).
2. Select your Wi-Fi Remote from the list, and click **UPDATE** if one is available.
3. Wait for update process to complete, which may take a few minutes. DO NOT unplug your Wi-Fi BacPac or power OFF your HD HERO2 camera during this process! (NOTE: If your Wi-Fi Remote is plugged into power during this update process, you may have to turn the device OFF for the update process to complete).
4. Up-to-date version will be reflected when Device Window refreshes.

Configuring Your Wi-Fi BacPac™ (optional)

1. Select your Wi-Fi BacPac from the list, and press **CONFIGURE**.
2. Change the name and password (password must be at least 8 ASCII characters).
3. Click **OK**.

NOTE: We highly encourage you to change your password, as your Wi-Fi BacPac is set to the factory default password 'goprohero'.

Troubleshooting Tips

We recommend unplugging any peripheral devices that may be plugged into your computer (including USB hubs and devices, external displays or Thunderbolt devices) before updating your GoPro devices.

If your GoPro devices are not recognized in the Device Window, try the following:

1. Press the **REFRESH** button at the bottom left of Device Window.
2. Unplug the device(s) and power cycle, then reconnect device(s) with power ON.
3. Try connecting your device(s) to a different USB port on your computer.
4. Try re-launching the GoPro Studio application, and/or re-launching the Device Window.
5. Make sure the device drivers have fully installed and the devices have been recognized by your computer.

Contact GoPro Support for additional information: http://gopro.com/support

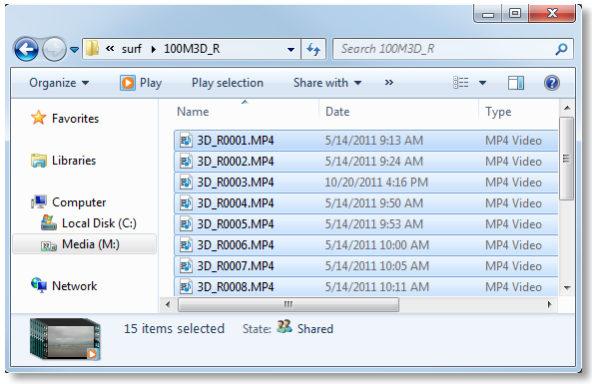
Advanced Features

Working with 3D Video Files

With GoPro Studio, you can convert files recorded using a GoPro 3D HERO System into 3D GoPro CineForm files (also called Stereo GoPro CineForm files). As with converting 2D files, there is some preparation required before importing these files into GoPro Studio.

About the File Structure

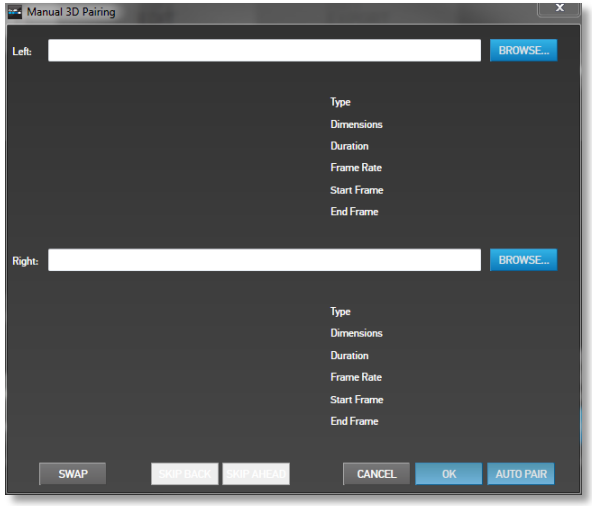
The GoPro 3D HERO System records video files on two separate SD cards—one from the camera representing the LEFT eye, and one from the camera representing the RIGHT eye. The files from the LEFT camera are saved in a folder called “100S3D_L” while the files from the RIGHT camera are saved in a folder called “100M3D_R”. In order for GoPro Studio to convert the files properly, you’ll need to keep the folders separate, just like they are on the SD cards.



Importing 3D Video Files

The process for converting time-lapse sequences into GoPro CineForm files is as follows:

1. Copy the “100M3D_R” and the “100S3D_L” folders from the DCIM folder on the SD card to a location on your computer. It is very important to place both these folders in the same location. For example, create a new folder on your computer called “My 3D Project” and then copy both the LEFT and RIGHT eye camera folders into that same folder. In the “My 3D Project” folder you should see both “100M3D_R” and 100S3D_L” listed as separate folders.
2. Click the **IMPORT NEW FILES** button and browse to the “100M3D_R” folder that contains the files you want to import.
3. Highlight the files you want to import and click **Open**. If you used the above method for maintaining the correct file structure, GoPro Studio will automatically locate the corresponding files from the “100S3D_L” folder and import these files as 3D.
4. Press ‘Ctrl+S’ on your keyboard to save the project.



Manually Importing

There may occasionally be times in which you will need to manually import a pair of 3D files. This can be the case if your files have been renamed or moved to folders that are not using the default folder names recorded in-camera. Fortunately, GoPro Studio lets you manually import and pair these files using the Manual Import option.

1. Right-click on a blank area of the Import Bin and select “Manual Import…” from the context menu that is displayed. This opens the Manual Import Window.
2. Use the BROWSE buttons to find the left and right source files.
3. The SKIP BACK and SKIP AHEAD buttons can be used to step through the clips frame-by-frame. Use these to compare your left and right images to make sure that they are synced with each other.
4. Click the OK button to pair the two clips or click the AUTO PAIR button to pair all of the clips found in the folder locations that you specified for your Left and Right clips.

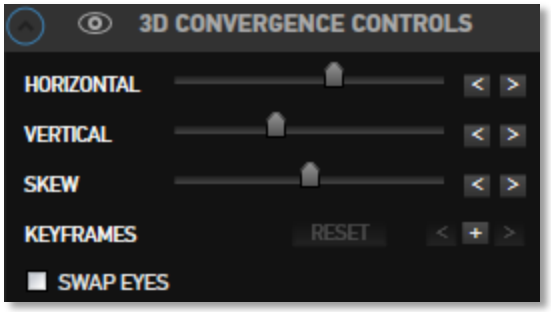
After importing your 3D files, you’ll see the word “3D” underneath their thumbnails in the Import Bin. This indicates that the files were successfully imported as 3D video files. You can now trim them and choose advanced conversion settings in the same way that you can with 2D files.

Adjusting 3D Convergence

When a 3D clip is selected on the Storyboard, the 3D CONVERGENCE CONTROLS appear in the right-hand column of GoPro Studio's EDIT Room. These controls allow you to change the feeling of depth and distance in your 3D video clips.

Select a 3D clip on the Storyboard and then click on the **Disclosure Triangle** to the left of the words "3D CONVERGENCE CONTROLS" to open the 3D CONVERGENCE CONTROLS panel giving you access to the following settings (if you don't see the 3D Convergence controls, you may also need to look in the Global Playback Settings and change the VIEW to an actual 3D mode, such as 'side-by-side' or 'anaglyph'):

ON/OFF Toggle Button



- **HORIZONTAL** Use the slider or step controls to modify the relative horizontal positioning between the left and right camera views, influencing how far in or out of the screen objects appear.
- **VERTICAL** Use the slider or step controls to modify the relative vertical positioning between the left and right camera views, correcting any vertical offset for an easier-to-view 3D image.
- **SKEW** Use the slider or step controls to modify the relative skew or rotational values between the left and right camera views, correcting any rotational offset between the left and right cameras for an easier-to-view 3D image.
- **KEYFRAMES** For advanced users, the 3D convergence controls can be keyframed. Use the + button to add a 3D convergence keyframe to the clip. This locks in the 3D convergence settings for the current frame on the Storyboard. You can then move the Play-head to another location on the Playback Slider to add another keyframe where you can have different 3D convergence settings
- **SWAP EYES** Use this checkbox to swap the left and right camera views in the selected clip, correcting for instances when the left and right camera files got switched during recording.

Click on the **Disclosure Triangle** to close the 3D CONVERGENCE CONTROLS panel.

TIP: Clicking on the ON/OFF Toggle button (which looks like an eyeball) will toggle the 3D CONVERGENCE CONTROLS adjustments ON or OFF for the selected clip on your Storyboard. You can use this to quickly switch back and forth between seeing the clips with the 3D convergence adjustments applied and the original images.

Exporting

When exporting a 3D file or Storyboard, the 3D FORMAT drop-down menu appears in the EXPORT Window, giving a choice of using the following 3D formats for your exported file:

- **Left Eye (2D)**
- **Side-by-Side (Most 3D TVs)**
- **Over-Under (Some 3D TVs)**
- **Anaglyph (3D on 2D display)**
- **Current 3D Display Mode**

Select the option that best meets the needs for your project and distribution outlets and then:

1. Browse to the desired folder location and type a filename in the ‘File name’ box.
2. Then click **SAVE** to start the export.

NOTE: Exporting may take a few minutes or even longer depending on the length of your Storyboard and the speed of your computer’s processor.

Working with Keyframes

In GoPro Studio's EDIT Room, the KEYFRAMES controls can be used to dynamically change how a clip will look when played back in the Media Bin or Storyboard.

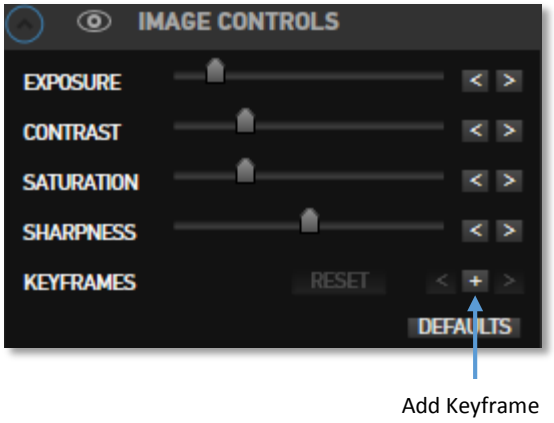
Keyframes are available in each of the following effect control panels:

- 3D Convergence Controls
- White Balance
- Image Controls
- Framing Controls
- Video Playback Controls (Premium and Professional version only)

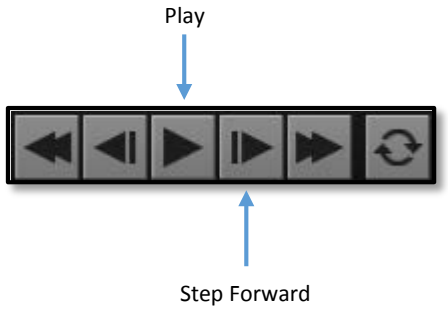
Let's look at a couple of different ways that you can use the KEYRAMES controls to affect the look of your clips.

EXAMPLE #1

Let's say that you want your clip to gradually change from color to black and white. Here's how you would accomplish this effect using KEYFRAMES in the IMAGE CONTROLS panel:



1. Select a clip in either the Media Bin or the Storyboard and move the playhead to the beginning of the clip.
2. Press the '+' button next to the KEYFRAMES. Doing this enables the keyframe feature and adds a new keyframe at the beginning of the clip.
3. Move the Play-head to a new location on the Playback Slider and the "+" button again to add a new keyframe.
4. Now drag the SATURATION slider all the way to the left to change its value to '0'.
5. Move the Storyboard Time Indicator to the beginning of the clip and press the PLAY button in the Playback Controls to see your clip gradually change from color to black and white.



EXAMPLE #2

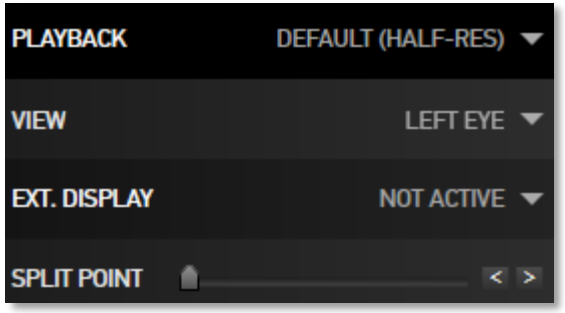
Now let's say that you want the first part of your clip to be in color and then immediately change from color to black and white from one frame to the next. Here's how to accomplish this effect:

1. Select a clip in either the Media Bin or the Storyboard and in the IMAGE CONTROLS panel, use the slider or step controls to set the SATURATION value to the default of '1'. You can also double-click on the word 'SATURATION' and that will set it to the default value.
2. Move the Play-head to a new location on the Playback Slider and press the '+' button. Unlike Example #1, this time leave the SATURATION value at '1'.
3. Then use the STEP FORWARD button in the Playback Controls to move forward one frame on the Playback Slider and press the '+' button again.
4. Now drag the SATURATION slider all the way to the left to change its value to '0'. This will automatically add a new keyframe at this location in the clip and apply the new SATURATION value to the remainder of the clip.
5. Press the PLAY button to see the clip playback in color at first and then instantly change to black & white when it reaches the point where you've changed the SATURATION value.

In both of these examples, you can continue to add more keyframes to further affect the look of your clips. Use the step controls to cycle through existing keyfames and press the '-' button to remove an existing keyframe.

NOTE: The above examples demonstrated the use of keyframes in the Image Controls Panel. The same techniques can be used in the 3D Convergence, White Balance and Framing Controls panels as well.

Global Playback Settings in the EDIT Room

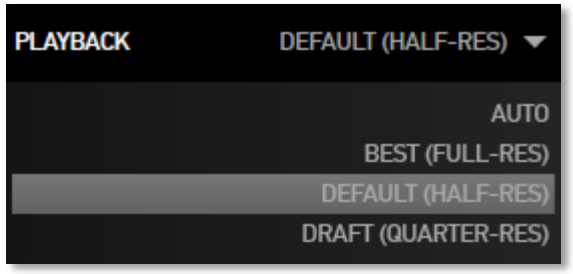


While in the **EDIT Room**, please take notice of the **GLOBAL PLAYBACK SETTINGS** panel found in the upper right-hand corner of GoPro Studio's EDIT Room. You can expand the size of this panel by clicking and dragging on the grey line that separates this panel from the VIDEO CONTROLS panel just beneath it.

It's important to recognize that the Global Playback Settings are not the same as the clip-based Video and Audio Playback Controls or the clip-based Color Correction and Framing Controls which appear just below the Global Playback Settings panel. They are different in that the Global Playback Settings affect how ALL GoPro CineForm files are played back (or decoded) while the clip-based controls only affect individual clips.

We will now look at each of the options in the Global Playback Settings.

PLAYBACK

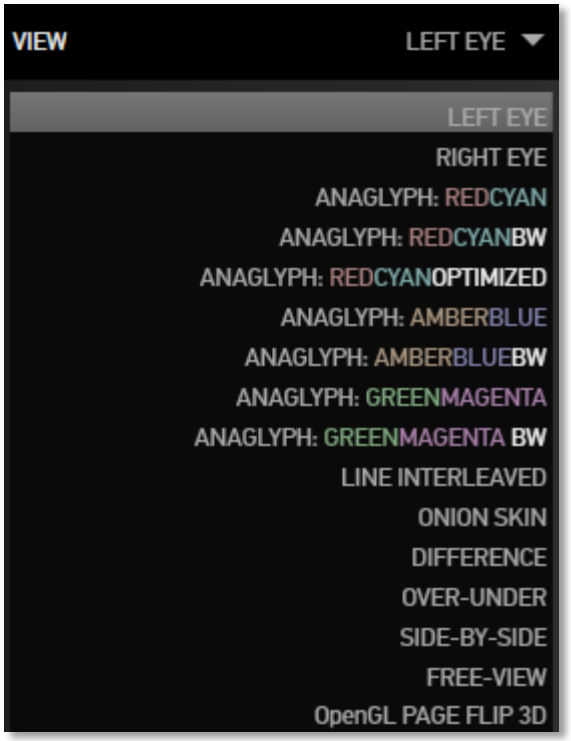


The **PLAYBACK** option determines the decode resolution used to playback GoPro CineForm files within the GoPro Studio application and offers the following choices:

- **AUTO**
- **BEST (FULL-RES)**
- **DEFAULT (HALF-RES)**
- **DRAFT (QUARTER-RES)**

Choose the option that provides the best playback performance for your computer. If the files are playing back choppy in the Preview Window, change to one of the lower settings or use the "AUTO" setting to allow GoPro Studio to choose the best option for your computer.

NOTE: When you export your storyboard (explained later) you will be able to choose between several export options, none of which are affected by the PLAYBACK setting chosen here. This option ONLY affects the 'playback' of files within GoPro Studio's EDIT Room.

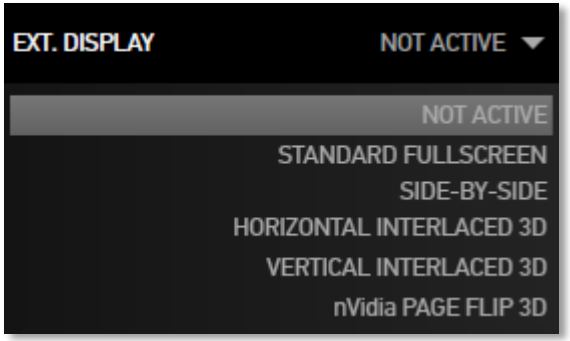


3D VIEW

The **VIEW** option determines the video display type that GoPro Studio's Player Window will use to playback 3D GoPro CineForm files and offers the following choices:

- **LEFT EYE** displays only the left eye of a 3D clip or the only eye for 2D clips
- **RIGHT EYE** displays only the right eye of your 3D clip or the only eye for 2D clips
- **ANAGLYPH: RED/CYAN** displays left and right eye tinted for viewing with RED & CYAN 3D glasses
- **ANAGLYPH: RED/CYAN/BW** displays left and right eye in black & white and tinted for viewing with RED/CYAN 3D glasses
- **ANAGLYPH: RED/CYAN/OPTIMIZED** displays left and right eye tinted for optimal viewing with RED/CYAN 3D glasses
- **ANAGLYPH: AMBER/BLUE** displays left and right eye tinted for viewing with AMBER/BLUE 3D glasses
- **ANAGLYPH: AMBER/BLUE/BW** displays left and right eye in black and white and tinted for viewing with AMBER/BLUE 3D glasses
- **ANAGLYPH: GREEN/MAGENTA** displays left and right eye tinted for viewing with GREEN/MAGENTA 3D glasses
- **ANAGLYPH: GREEN/MAGENTA/BW** displays both left and right eye in black and white and tinted for viewing with GREEN/MAGENTA 3D glasses
- **LINE INTERLEAVED** displays left and right eye by alternating between every other horizontal line—used for certain polarized, passive 3D displays and polarized glasses
- **ONION SKIN** displays left and right eye superimposed together in normal color—useful to help align images during convergence adjustments
- **DIFFERENCE** displays the differences between the left eye and the right eye—useful to help align images during convergence adjustments
- **OVER-UNDER** displays left and right eye stacked on top of each other and scaled vertically into one frame—used by common 3D monitors and televisions
- **SIDE-BY-SIDE** displays left and right eye next to each other, scaled horizontally into one frame—used by common 3D monitors and television sets
- **FREE-VIEW** displays left and right eye side by side in normal aspect ratio
- **OpenGL PAGE FLIP 3D** displays left and right file with each of their frames being alternated sequentially—used with nVidia Quadro-based display adapters

NOTE: When working with 2D clips, always use the 'LEFT EYE' option to ensure proper playback.

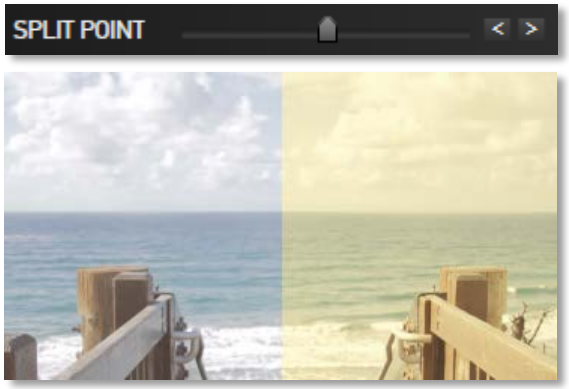


EXTERNAL DISPLAY

The **EXT. DISPLAY** (external display) option determines the video display type for a secondary monitor (if you have one connected) and offers the following choices:

- **NOT ACTIVE** (secondary monitor is not used)
- **STANDARD FULLSCREEN** (displays standard 2D on secondary display—used for 2D clips)
- **SIDE-BY-SIDE** (displays side-by-side 3D mode on secondary display—used by 3D monitors that support this mode)
- **HORIZONTAL INTERLACED 3D** (displays horizontal interlaced 3D mode on secondary display—used by 3D monitors that support this mode)
- **VERTICAL INTERLACED 3D** (displays vertical interlaced 3D mode on secondary display— used by 3D monitors that support this mode)
- **nVidia PAGE FLIP 3D** (displays frame sequential 3D mode on secondary display—used with nVidia Quadro-based display adapters and 3D monitors that support this mode)

NOTE: When working with 2D clips, always use the 'STANDARD FULSCREEN' option to playback the contents of the Player Window on a secondary monitor. If you'd rather not use a secondary monitor at all, use the 'NOT ACTIVE' option.

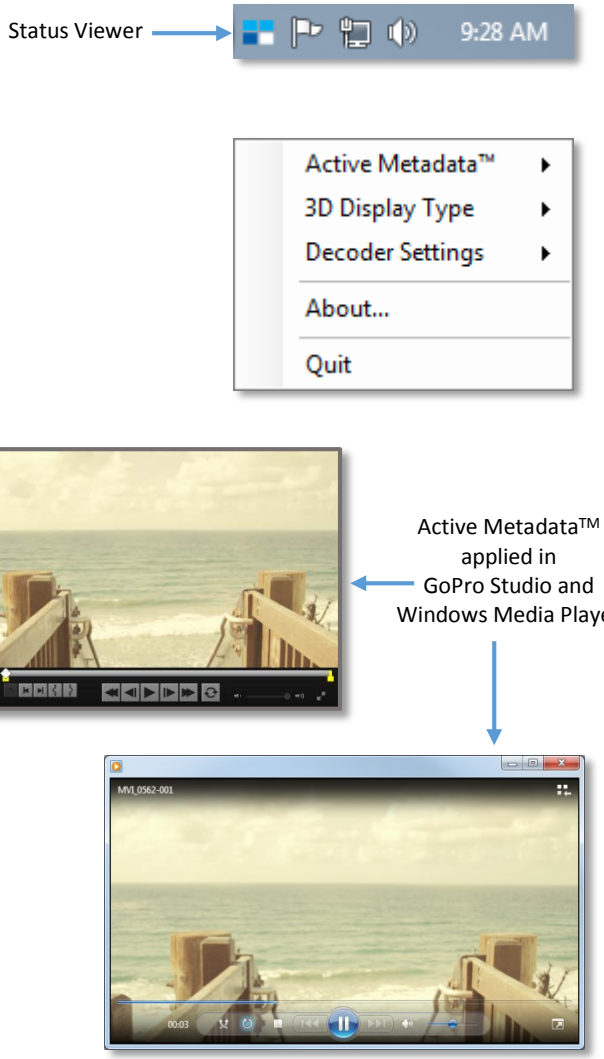


Before (no adjustments) After (with 1970s Preset)

SPLIT POINT

The **SPLIT POINT** option allows you to easily see the effects of your Active Metadata™ adjustments (made using the clip-based Color Correction, Framing Controls and Effect Presets) by splitting the image into 'before' (uncorrected) and 'after' (corrected) sides. The left side of the image is the 'before' view while the right side of the image is the 'after view'. The slider lets you choose where that split occurs in the image frame.

NOTE: For normal use, you'll want to keep the SPLIT POINT slider all the way to the left. This will ensure that you'll be able to see all the Effect Presets, Color Correction and Framing adjustments that have been applied to your clips. Only use the slider if you want to compare your adjustments to the original file.



The GoPro CineForm Status Viewer

After installing GoPro Studio, you may have noticed a new icon in your Windows System Tray. This is the “GoPro CineForm Status Viewer”. If you’re not sure what we’re referring to, the Windows System Tray is the little area down by the system clock and the GoPro CineForm Status Viewer is represented as an icon that resembles the GoPro logo.

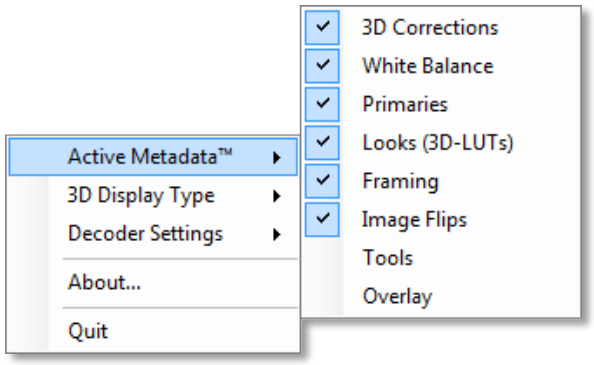
When playing GoPro CineForm files in applications other than GoPro Studio, you can use the Status Viewer to determine various decode settings. To be more specific, the Status Viewer allows you to do the following:

- Enable or Disable Active Metadata adjustments for desktop playback
- Choose the desired 3D Display Type for desktop playback
- Modify other desktop playback decode settings
- Check for updates to your GoPro Studio software

To view these decode settings in action we will need to load a GoPro CineForm file in GoPro Studio’s EDIT Room while simultaneously viewing that same file in Windows Media Player (or other application that supports playback of standard AVI or MOV files).

1. Select a GoPro CineForm file in the Media Bin in GoPro Studio’s EDIT Room.
2. Now play that same file in Windows Media Player. The file played in Windows Media Player should look the same as the file when played in the Player Window in GoPro Studio’s EDIT Room. (You can right-click on the file in the Media Bin and click ‘Reveal in Explorer’ to quickly find the file on your computer—then double-click it to play it in Windows Media Player).
3. Switch back to GoPro Studio. With the file still selected in the Media Bin, apply an effect PRESET to the clip (such as the 1970s preset). The file should now play in GoPro Studio’s Player Window with the effect preset applied.
4. Once again, switch over to Windows Media Player where you should now see the file playing with the same effect preset applied.

Active Metadata adjustments applied to GoPro CineForm files in the Media Bin of GoPro Studio’s EDIT Room affect how the files are played back in other applications as well. This is one of the unique features of the GoPro CineForm codec as it allows you to customize your files without having to render or export new versions of them.



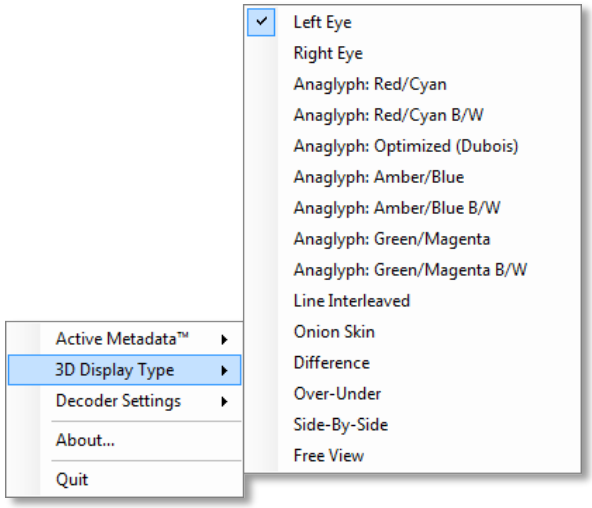
Active Metadata

With the Status Viewer Icon, you can toggle the Active Metadata adjustments on or off so that your files can easily be played in other applications with or without the adjustments that you've applied in the GoPro Studio's EDIT Room. Using the **Active Metadata™** sub-menu in the Status Viewer, you can enable or disable the following Active Metadata settings:

- **3D Corrections**
- **White Balance**
- **Primaries (image controls)**
- **Looks (3D-LUTs)**
- **Framing**
- **Image Flips**
- **Tools**
- **Overlay**

To turn off the adjustments for a particular Active Metadata control, simply uncheck it from this sub-menu. To re-enable an adjustment, simply re-check it.

NOTE: The Tools and Overlay Active Metadata controls only apply to the Premium and Professional versions of GoPro Studio. If you are using the free version, its best to keep these unchecked.



3D Display Type

The **3D Display Type** sub-menu in the GoPro CineForm Status Viewer determines the video display type that 3rd party video applications will use to playback 3D GoPro CineForm files similar to the way the VIEW option does this in GoPro Studio's EDIT Room.

- **LEFT EYE** displays only the left eye of a 3D clip or the only eye for 2D clips
- **RIGHT EYE** displays only the right eye of your 3D clip or the only eye for 2D clips
- **ANAGLYPH: RED/CYAN** displays left and right eye tinted for viewing with RED/CYAN 3D glasses
- **ANAGLYPH: RED/CYAN/BW** displays left and right eye in black and white and tinted for viewing with RED/CYAN 3D glasses
- **ANAGLYPH: RED/CYAN/OPTIMIZED** displays left and right eye tinted for optimal viewing with RED/CYAN 3D glasses
- **ANAGLYPH: AMBER/BLUE** displays left and right eye tinted for viewing with AMBER/BLUE 3D glasses
- **ANAGLYPH: AMBER/BLUE/BW** displays left and right eye in black and white and tinted for viewing with AMBER/BLUE 3D glasses
- **ANAGLYPH: GREEN/MAGENTA** displays left and right eye tinted for viewing with GREEN/MAGENTA 3D glasses
- **ANAGLYPH: GREEN/MAGENTA/BW** displays both left and right eye in black and white and tinted for viewing with GREEN/MAGENTA 3D glasses
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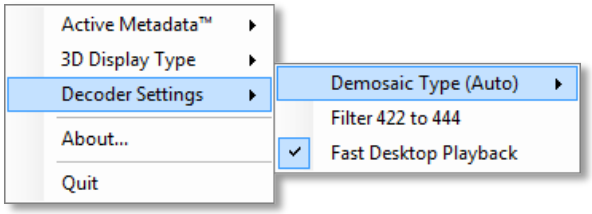
- **SIDE-BY-SIDE** displays left and right eye next to each other and scaled horizontally into one frame—used by common 3D monitors and television sets
- **FREE-VIEW** displays left and right eye side by side in normal aspect ratio

NOTE: When working with 2D clips, always use the 'LEFT EYE' option to ensure proper playback.



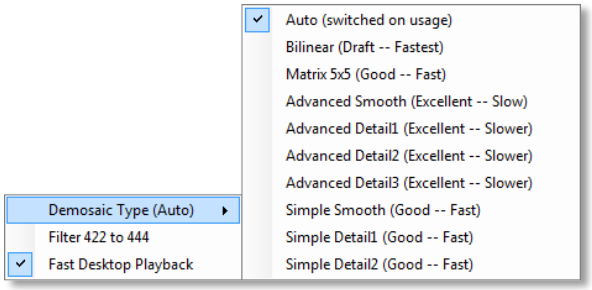
Decoder Settings

In the GoPro CineForm Status Viewer the **Decoder Settings** sub-menu gives you access to the following advanced codec settings:

- **Demosaic Type**
- **Filter 422 to 444**
- **Fast Desktop Playback**

Let's discuss each of these decoder settings in more detail.

Demosaic Type


Demosaic Type (Auto)
Filter 422 to 444
Fast Desktop Playback
Auto (switched on usage)
Bilinear (Draft -- Fastest)
Matrix 5x5 (Good -- Fast)
Advanced Smooth (Excellent -- Slow)
Advanced Detail1 (Excellent -- Slower)
Advanced Detail2 (Excellent -- Slower)
Advanced Detail3 (Excellent -- Slower)
Simple Smooth (Good -- Fast)
Simple Detail1 (Good -- Fast)
Simple Detail2 (Good -- Fast)

When shooting with a RAW single sensor camera like Arri D-20, RED Epic or Blackmagic Cinema Camera, the final output quality is impacted significantly by the demosaic algorithm, possibly as much as any compression applied. The demosaic algorithm is the process that converts the one value per pixel of a raw bayer sensor to the more useful three color primaries per pixel like RGB (see Wikipedia article on demosaicing.)

'BiLinear Demosaic' is a simple, fast demosaic filter suitable for real-time playback but not suitable for final rendered output. During editorial it is helpful to use BiLinear Demosaic because it requires the least CPU resource.

TIP: Think of the progression of Demosaic algorithms between BiLinear and CF Advanced Detail 3 as providing additional sharpening detail in your final output.

NOTE: The Demosaic Type only affects CineForm RAW files. CineForm RAW files can only be created from camera RAW source files, like you'll get when recording with an Arri D-20, RED EPIC or Blackmagic Cinema Camera (in CinemaDNG mode) or created at record time using a Silicon Imaging SK-2K Digital Cinema Camera, KineRAW S-35 or Cinedeck direct-to-disk recorder.

Filter 422 to 444

If you're using 3rd party applications that take advantage of the higher color space used in RGB 4:4:4 encoded files, you can use the **Filter 422 to 444** option in the GoPro CineForm Status Viewer to cause 4:2:2 encoded GoPro CineForm files to be decoded in 4:4:4 color space. Since normally 4:4:4 encoded files take up more space on your hard drive, this is a great way to save space while still retaining the image quality you would get from an actual 4:4:4 encoded file.

Fast Desktop Playback

On some older or under-powered computers, you may experience performance issues when attempting to playback GoPro CineForm files…especially those at higher resolutions or with a large amount of Active Metadata adjustments applied. In situations like this, you can use the **Fast Desktop Playback** in the GoPro CineForm Status Viewer to cause your GoPro CineForm files to playback at half their normal resolution. This is a great way to allow you to play back your high-quality GoPro CineForm files on systems that don't necessarily meet the minimum system requirements.

About

Clicking the **About** option in the GoPro CineForm Status Viewer launches the About GoPro Studio window. In this window, you'll see the currently installed version of GoPro Studio (if there is a newer version available, that will also be indicated).

Check the box that says 'automatically check for updates' if you would like the taskbar to notify you when a new version becomes available.

If you opt not to automatically check for updates, you can click on the **Check Now** button to manually check for updates.

If an update is available, click the **Update…** button to launch a web browser taking you to gopro.com, where you can download the latest version of GoPro Studio.

Moving GoPro CineForm Files to Other Computers

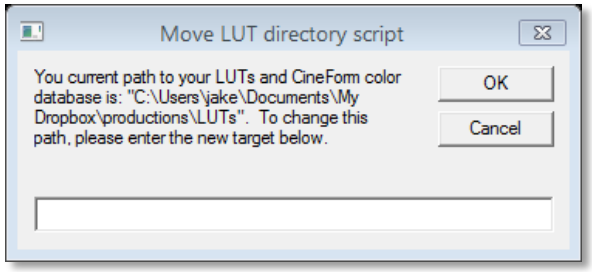
As detailed in previous chapters, the 3D Color and Framing adjustments applied to converted GoPro CineForm files in GoPro Studio's EDIT Room are accomplished using the GoPro CineForm Codec's Active Metadata™ technology. This Active Metadata is saved in a database file on your computer's hard drive.

The default location for the database files is "C:\Users\Public\CineForm\LUTs" on Windows computers and "Macintosh HD/Library/Application Support/CineForm/LUTs/" on Mac computers.

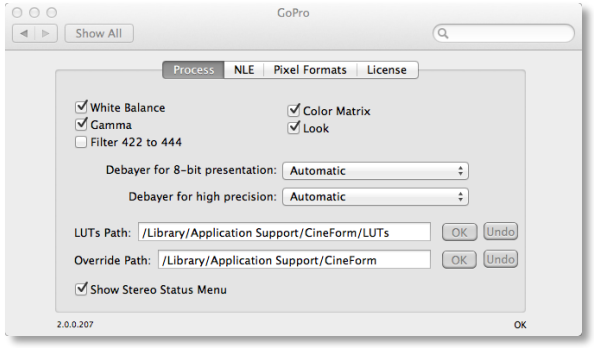
When your computer plays back a GoPro CineForm file, it cross-references the database and plays back the file with the settings it finds there. If you were to move these files to another computer, they will not play with the adjustments applied…unless you copied the database files as well.

As an alternative to copying the database files, you could share a single database location across multiple computers. You can change the database location to a shared network drive or a Dropbox location. With a shared database location, your GoPro CineForm files will playback with the same Active Metadata™ adjustments on every system (Windows or Mac) that is pointing to the shared database.

To change the database location on a Windows system:


Move LUT directory script
You current path to your LUTs and CineForm color database is: "C:\Users\jake\Documents\My Dropbox\productions\LUTs". To change this path, please enter the new target below.
OK
Cancel

1. Download and unzip this file: http://software.gopro.com/other/MoveLUTsAndDatabase.zip
2. Then double-click on the "MoveLUTsAndDatabase.vbs" file to launch the Move LUT directory script.
3. Type in the desired location for the database (shared network drive or Dropbox folder) and click **OK**.
4. Repeat these steps on any other Windows computers on which you wish to have the database shared.



To change the database on a Mac system:

1. Launch the Mac System Preferences
2. Click on the **GoPro** icon in the 'Other' section of the System Preferences.
3. In the Processes panel, type in the desired location for the database in the LUTs Path: text entry box (shared network location or Dropbox folder).
4. Close the system preferences.
5. Repeat these steps on any other Mac computers on which you wish to have the database shared.

Now any time you make an adjustment to a GoPro CineForm file in Studio's EDIT Room, those adjustments will be applied to the clip on your other computers as well.

NOTE: This technique is only used for GoPro CineForm files whose adjustments have been applied directly in the Media Bin in GoPro Studio's EDIT Room. Adjustments made to instances of clips loaded onto the Storyboard use a separate internal database and cannot be moved from one computer to another.

USING GOPRO STUDIO WITH 3RD PARTY APPLICATIONS

As mentioned in the chapter "Understanding the Workflow", GoPro Studio can be used as a stand-alone application or in tandem with other 3rd party applications. In this chapter we will discuss the latter workflow using GoPro Studio with other applications. The overall process for this workflow is as follows:

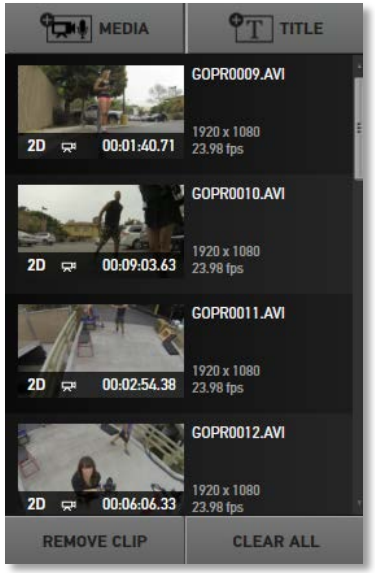
1. Convert your source files into GoPro CineForm files.
2. Apply Image Development and other Active Metadata adjustments to the GoPro CineForm files using GoPro Studio's EDIT Room.
3. Take those same GoPro CineForm files (without exporting) into your other applications for editing.
4. Optionally switch back and forth between your other application and GoPro Studio to make further adjustments and enhancements to the files.
5. Export a high-quality master file in the other application using the GoPro CineForm codec.

NOTE: Some understanding of your 3rd party applications are required for a portion of this workflow. Please refer to the documentation included with those applications where necessary.

Importing GoPro CineForm Files

The process of importing and converting source files in this workflow is the same as if you were using GoPro Studio as a stand-alone application, so rather than repeat information that was already discussed, we'll simply refer you to the chapter "Using the IMPORT Room".

Working with Files in the Media Bin



Once you've converted your source files into GoPro CineForm files, you're ready to start working with them in GoPro Studio's EDIT Room. If you're not already there, launch GoPro Studio and go to the EDIT Room.

NOTE: If the Edit Template Selection Window appears, select the "BLANK TEMPLATE" option and then click the CREATE button.

If you don't see your converted GoPro CineForm files in the Media Bin, do the following:

1. Click the **ADD MEDIA** button and browse to the location of your converted GoPro CineForm files.
2. Highlight the files you wish to import and click **Open**.
3. After the files have loaded into the Media Bin, press 'Ctrl+S' on your keyboard to save your project.

Clips loaded into the Media Bin are represented as thumbnails, similar to how they look in the Import Bin in the IMPORT Room. Along with each thumbnail, the following clip details are indicated:

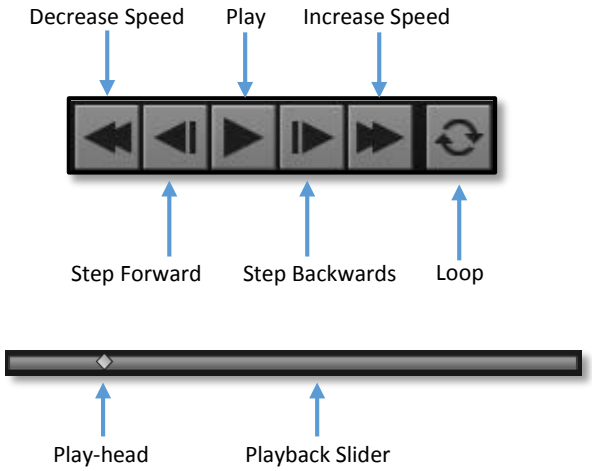
- **Filename**
- **Image Size**
- **Frame rate or Frame Count**
- **2D or 3D**
- **Video or Time-Lapse Icon**
- **Duration**

You can select different files in the Media Bin by simply clicking on them or by using the up and down arrow keys on your keyboard to cycle through them.

To remove a clip from the Media Bin, select the clip you wish to remove and click on the **REMOVE CLIP** button at the bottom of the Media Bin.

To remove all clips from the Media Bin, click the **CLEAR ALL** button at the bottom of the Media Bin.

Previewing Clips in the Player Window



Click on a file in the Media Bin to select it. That loads it into the Player Window. Now you can use the Playback Controls to playback the clip and view it in the Player Window.

- Press the **PLAY** button in the Playback Controls (or the SPACEBAR on your keyboard) to see the clip playback in the Player Window.
- The **Decrease Speed** and **Increase Speed** buttons can be used to play the video faster or slower.
- Use the **Step Forward** and **Step Backwards** buttons to step through the clip one frame at a time.
- Press the **LOOP** button to cause playback to start over from the beginning when the Play-head reaches the end of the clip.

You can also use the Play-head on the Playback Slider to navigate through the clip. To do this, just click on the diamond-shaped Play-head and drag left or right through the Playback Slider.

Diverging from the Previous Workflow

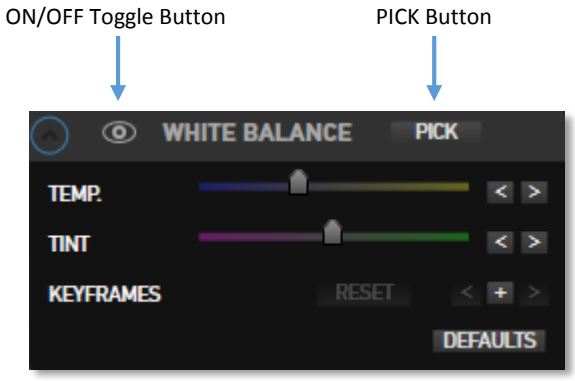
Before we go any further, it should be pointed out that this is where the “Using GoPro Studio with 3rd Party Application” workflow diverges from the “Using GoPro Studio as a Stand-Alone Application workflow”.

Rather than applying color correction, framing and other adjustments to your clips on the Storyboard, you’ll be applying the adjustments to the clips while they are still in the Media Bin. In fact, the Storyboard is not used at all in this workflow.

Now that we have cleared that up, let’s add Active Metadata™ adjustments to your clips in the Media Bin.

Color Correcting Clips

The underlying Active Metadata architecture used in the GoPro CineForm codec enables you to do real-time non-destructive image development adjustments to your clips. These adjustments affect the overall color and tone of your clips. The controls to apply these adjustments are located in the WHITE BALANCE and IMAGE CONTROLS panels on the right-hand side of GoPro Studio's EDIT Room.



WHITE BALANCE

Select a clip in the Media Bin and then click on the **Disclosure Triangle** to the left of the words "WHITE BALANCE" to open the WHITE BALANCE panel giving you access to the following settings:

- **TEMP** Use the slider or step controls to adjust the overall color temperature of the image.
- **TINT** Use the slider or step controls to adjust the overall tint of the image.
- **KEYFRAMES** Use the + button to add a white balance keyframe to the clip. This locks in the white balance settings for the current frame in the clip. You can then move the Play-head to another location on the Playback Slider to add another keyframe where you can have different white balance settings. This is a great way to have the white balance settings change over the duration of the clip.

For a clip with a white element in the scene, click on the **PICK** button and then click on the white element of your image in the Playback Window to have GoPro Studio automatically adjust the white balance based on that element.

Click on the **DEFAULTS** button to reset all of the values in the WHITE BALANCE panel to their original settings. Double-click on an individual Control to reset only its value.

Click on the **Disclosure Triangle** to close the WHITE BALANCE panel.

TIP: Clicking on the ON/OFF Toggle button (which looks like an eyeball) will toggle the WHITE BALANCE adjustments ON or OFF for all clips in the Media Bin. You can use this to quickly switch back and forth between seeing the clips with the adjustments applied and the original images.

ON/OFF Toggle Button

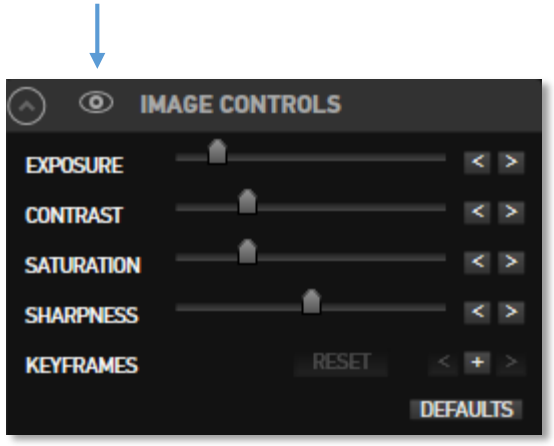


IMAGE CONTROLS

Select a clip in the Media Bin and then click on the **Disclosure Triangle** to the left of the words “IMAGE CONTROLS” to open the IMAGE CONTROLS panel giving you access to the following settings:

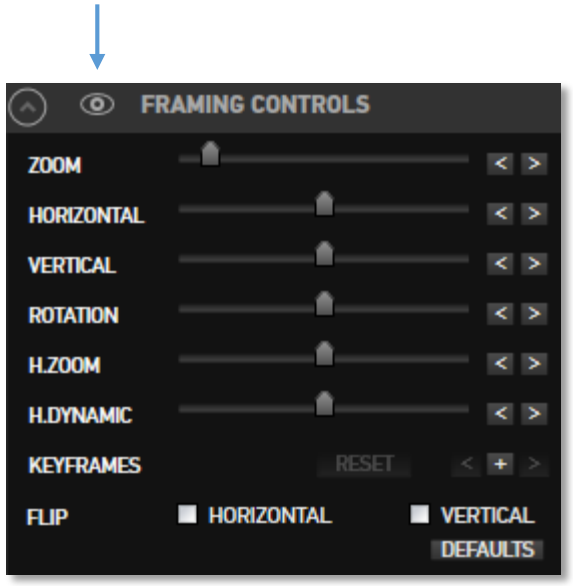
- **EXPOSURE** Use the slider or step controls to adjust the brightness and darkness of the image.
- **CONTRAST** Use the slider or step controls to adjust the relative definition between bright and dark areas of the image.
- **SATURATION** Use the slider or step controls to adjust the vibrancy of the colors in the image.
- **SHARPNES** Use the slider or step controls to adjust the softness and sharpness of the image.
- **KEYFRAMES** Use the + button to add a white balance keyframe to the clip. This locks in the image control settings for the current frame in the clip. You can then move the Play-head to another location on the Playback Slider to add another keyframe where you can have different image control settings. This is a great way to have the image control settings change over the duration of the clip.

Click on the **DEFAULTS** button to reset all of the values in the IMAGE CONTROLS panel to their original settings. Double-click on an individual Control to reset only its value.

Click on the **Disclosure Triangle** to close the IMAGE CONROLS panel.

TIP: Clicking on the ON/OFF Toggle button (which looks like an eyeball) will toggle the IMAGE CONTROLS adjustments ON or OFF for ALL clips in the Media Bin. You can use this to quickly switch back and forth between seeing the clips with the adjustments applied and the original images.

ON/OFF Toggle Button



Framing Clips

GoPro Studio's FRAMING CONTROLS allow you to change the composition of your clips. Select a clip in the Media Bin and then click on the **Disclosure Triangle** to the left of the words "FRAMING CONTROLS" to open the FRAMING CONTROLS panel giving you access to the following settings:

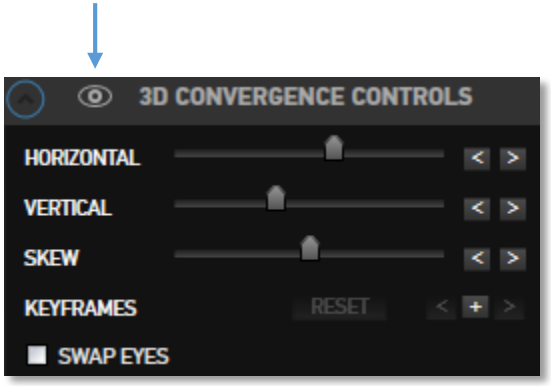
- **ZOOM** Use the slider or step controls to adjust scale of the image.
- **HORIZONTAL** Use the slider or step controls to adjust the horizontal location of the image.
- **VERTICAL** Use the slider or step controls to adjust the vertical location of the image.
- **ROTATION** Use the slider or step controls to slightly rotate the clip clockwise or counter-clockwise.
- **H.ZOOM** Use the slider or step controls to adjust the horizontal scaling of the image.
- **H.DYNAMIC** Use the slider or step controls to adjust the horizontal stretch point of the image. This control is best used in tandem with the H.ZOOM control.
- **KEYFRAMES** Use the + button to add a framing keyframe to the clip. This locks in the framing control settings for the current frame in the clip. You can then move the Play-head to another location on the Playback Slider to add another keyframe where you can have different framing control settings. This is a great way to have the framing control settings change over the duration of the clip.
- **FLIP** Use the check boxes to enable or disable horizontal or vertical flipping on the image.

Click on the **DEFAULTS** button to reset all of the values in the FRAMING CONTROLS panel to their original settings. Double-click on an individual Control to reset only its value.

Click on the **Disclosure Triangle** to close the FRAMING CONTROLS panel.

TIP: Clicking on the ON/OFF Toggle button (which looks like an eyeball) will toggle the FRAMING CONTROLS adjustments ON or OFF for all clips in the Media Bin. You can use this to quickly switch back and forth between seeing the clips with the framing adjustments applied and the original images.

ON/OFF Toggle Button



Adjusting 3D Convergence

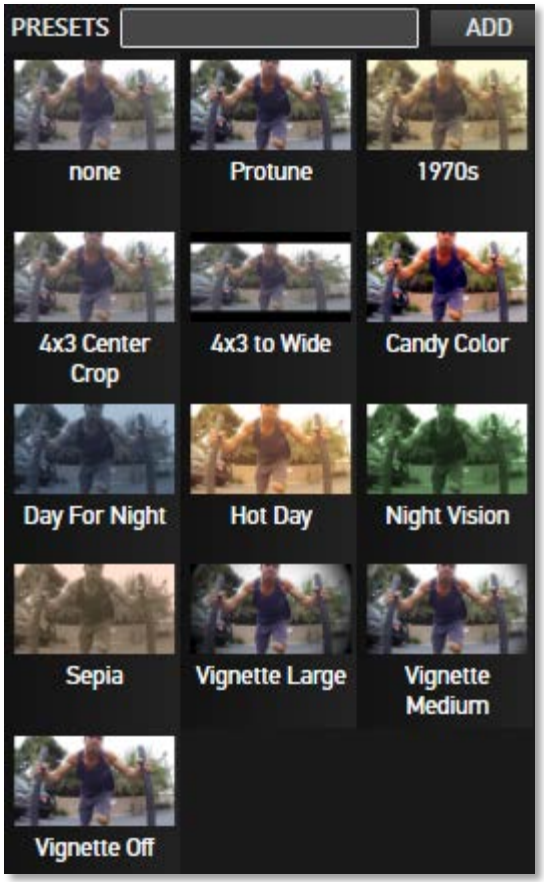
When a 3D clip is selected in the Media Bin, the 3D CONVERGENCE CONTROLS appear in the right-hand column of GoPro Studio's EDIT Room. These controls allow you to change the feeling of depth and distance in your 3D video clips.

Select a 3D clip in the Media Bin and then click on the **Disclosure Triangle** to the left of the words "3D CONVERGENCE CONTROLS" to open the 3D CONVERGENCE CONTROLS panel giving you access to the following settings (if you don't see the 3D Convergence controls, you may also need to look in the Global Playback Settings and change the VIEW to an actual 3D mode, such as 'side-by-side' or 'anaglyph'):

- **HORIZONTAL** Use the slider or step controls to modify the relative horizontal positioning between the left and right camera views.
- **VERTICAL** Use the slider or step controls to modify the relative vertical positioning between the left and right camera views
- **SKEW** Use the slider or step controls to modify the relative skew or rotational values between the left and right camera views.
- **KEYFRAMES** Use the + button to add a 3D convergence keyframe to the clip. This locks in the 3D convergence settings for the current frame in the clip. You can then move the Play-head to another location on the Playback Slider to add another keyframe where you can have different 3D convergence settings
- **SWAP EYES** Use this checkbox to swap the left and right camera views in the selected clip.

Click on the **Disclosure Triangle** to close the 3D CONVERGENCE CONTROLS panel.

TIP: Clicking on the ON/OFF Toggle button (which looks like an eyeball) will toggle the 3D CONVERGENCE CONTROLS adjustments ON or OFF for all clips in the Media Bin. You can use this to quickly switch back and forth between seeing the clips with the 3D convergence adjustments applied and the original images.



Applying Effect Presets

In GoPro Studio's EFFECT PRESETS panel, you can choose from several pre-made color and vignette effects and apply them to your clips in the Media Bin. This is a quick and easy way to make your clips look more dynamic. Select a clip in the Media Bin and then click on one of the following EFFECT PRESETS to apply it to the clip:

- **NONE** resets all Color Correction and Framing adjustments to their defaults.
- **PROTUNE** applies a saturation and contrast adjustment to footage shot in the Protune mode in the HD HERO2 and HERO3, making it look more punchy.
- **1970S** applies a warm color effect that simulates film shot in the 1970s.
- **4X3 CENTER CROP** zooms in on a clip shot with a 4x3 aspect ratio while cropping the top and bottom portions of the image.
- **4X3 TO WIDE** applies a combination of framing adjustments to transform a clip shot in 4x3 aspect ratio to a 16:9 image.
- **CANDY COLOR** applies a highly saturated color effect to the clip.
- **DAY FOR NIGHT** applies a color effect that simulates footage that was shot at night.
- **HOT DAY** applies a warm color effect that simulates being close to the sun.
- **NIGHT VISION** applies a green tint over the image simulating an infrared look that you see when using night vision goggles.
- **SEPIA** applies a brownish and unsaturated effect to achieve a sepia tone look.
- **VIGNETTE LARGE** applies a large vignette to the image.
- **VIGNETTE MEDIUM** applies a medium-sized vignette to edges of the image.
- **VIGNETTE OFF** applies a small vignette to the edges of the image.

To create your own PRESET, do the following:

1. Select a video clip in the Media Bin.
2. Use the WHITE BALANCE, IMAGE CONTROLS and FRAMING CONTROLS to dial in your own custom look.
3. Type a name for the new preset in the text box next to the word PRESET in the PRESET panel.
4. Click on the **ADD** button.

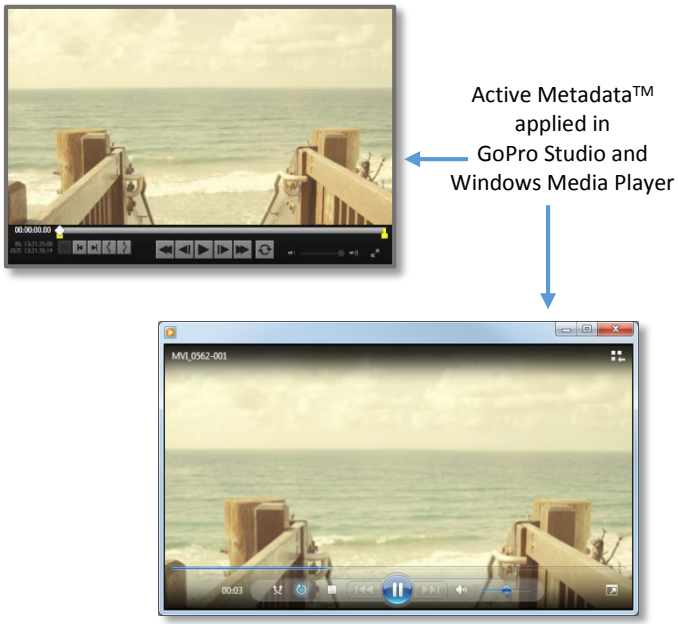
Press the **RESET ALL** button to return all of the WHITE BALANCE, IMAGE CONTROLS, FRAMING CONTROLS and EFFECT PRESETS applied on a clip to their default values.

Copying Settings from One Clip to Another

If you're happy with the look of a particular clip and want to apply some or all of the settings to another clip, you can easily accomplish this by doing the following:

1. Click on clip in the Media Bin that has the settings you want to copy to other clips.
2. Then select "Copy" from the EDIT Menu (or press 'Ctrl+C' on your keyboard).
3. Now click on the clip where you want to copy the settings to.
4. Then select "Paste" from the EDIT Menu (or press 'Ctrl+V' on your keyboard).
5. Continue pasting these settings on any additional clips by repeating steps 4 and 5 above. To apply the same settings to ALL the clips in the Media Bin, press 'Ctrl+A' to select all the clips and then select "Paste" from the EDIT Menu.

Playing Files in Windows Media Player



When you're happy with the adjustments that you've applied to a clip in the Media Bin, you can open the file in Windows Media Player to see how it plays there. This will demonstrate how the Active Metadata™ adjustments applied within GoPro Studio affect how a clip plays back in other applications as well.

1. Right-click on a clip in the Media Bin and then click 'Open in Explorer'.
2. Double-click on the file in Windows Explorer to launch it in Windows Media Player.

Notice how the file plays back with the GoPro Studio adjustments applied? Other video applications would have required you to export a new version of the clip in order for it to playback in Windows Media Player with color correction and other effects applied. The ability to apply these real-time color and effects is a unique feature of the GoPro CineForm codec enabled by its Active Metadata architecture.

Now that you've seen this in action using Windows Media Player, you can take the next step and import your GoPro CineForm files into other 3rd party editing, color correction or compositing applications.

Using GoPro CineForm Files in Other Applications

There are many video editing, color correction and compositing applications available today. GoPro CineForm files are compatible with those that support standard Windows AVI and QuickTime MOV files.

Avoiding Re-Transcoding

For most 3rd party applications you can use its standard import method to load your GoPro CineForm files into the application. Some of these applications, however, will attempt to re-'transcode' or 'optimize' your video files during the import process. This is not necessary with GoPro CineForm files because they are already optimized and if you re-transcode them, you'll lose the ability to make further adjustments to them in GoPro Studio.

Below, we'll discuss how to disable or get around the re-transcoding process that some specific 3rd party applications employ.

NOTE: In some consumer-level applications, it is impossible to avoid the re-transcoding process. In these situations, the GoPro CineForm workflow ends when you import your GoPro CineForm files into those applications. However, you will be able to continue using the workflow employed by that particular application.

Importing Into AVID Media Composer

When importing GoPro CineForm MOV files into AVID Media Composer, use the 'Link to AMA' option in the Media Composer File menu. This will force Media Composer to import the GoPro CineForm files as standard GoPro CineForm QuickTime files rather than re-transcode them into AVID's DNxHD format. GoPro CineForm AVI files are not supported as of Media Composer 7.

Importing Into iMovie

When importing GoPro CineForm files into iMovie, uncheck the 'Optimize video' option in the 'Import Movies…' dialog box. This will ensure that your GoPro CineForm files will not be re-transcoded into Apple Intermediate files.

Importing Into Final Cut Pro X

When using GoPro CineForm files in Final Cut X project, set the following options in the Final Cut Pro X Preferences:

- In the 'Import Media…' panel, uncheck the 'Create optimized media' option.
- In the 'Playback' panel, uncheck the 'Background render' option.

This will ensure that your GoPro CineForm files will not be re-transcoded to Apple Intermediate files.

NOTE: Other applications may require you to perform similar steps to allow your GoPro CineForm files to import normally. Please refer to those applications' own manuals for specific instructions on how to do so.

Switching Between GoPro Studio and Other Applications

While using your GoPro CineForm files in other applications, at any time, you can switch focus back to GoPro Studio's EDIT Room and apply further adjustments to refine the look of your clips. Then switch back to the 3rd party application to see your clips immediately updated with the new look.

Disabling Timeline Frame Caching

Some non-linear editing applications use what is called 'frame-caching' to improve playback performance. When frame-caching is employed, the Active Metadata™ adjustments made in GoPro Studio may not appear right away when you play back the file in the 3rd party application. This is because the 3rd party application doesn't realize that the file has changed and therefore plays its frames from the cache rather than re-decoding the source file.

To get around this, you can do any or all of the following:

- Disable frame caching (if possible)
- Clear the cache (if possible)
- Play or scrub through the timeline to flush the cache.
- Change timeline resolution (this clears the cache in Adobe Premiere Pro)

Exporting GoPro CineForm Files

When you're done editing in your 3rd party application you can export a high-quality master GoPro CineForm file. The method for doing this will differ from application to application so please refer to the application's own manual for specific instructions.

NOTE: When exporting to the GoPro CineForm codec using 3rd party applications, there is an encoding limit of 1920 x 1080 resolution with the free version of GoPro Studio. This means that if you wish to encode at resolutions higher than 1920 x 1080 using 3rd party applications, you will need to use GoPro Studio Premium or GoPro Studio Professional.

GOPRO STUDIO PREMIUM AND GOPRO STUDIO PROFESSIONAL

GoPro Studio comes in three versions: GoPro Studio (free), GoPro Studio Premium and GoPro Studio Professional. So far this manual has focused on the features common to all three versions of the software. The following pageswill provide information about the additional features available in the Premium and Professional versions.

GoPro Studio Premium

In addition to all the features described so far, GoPro Studio Premium adds the following:

Within the GoPro Studio application:

- Support for more camera formats in the IMPORT Room (AVCHD, MVC, etc.)
- Support for multiple Active Metadata™ databases
- Advanced image analysis Tools
- WORKSPACE CONTROLS
- Additional 3D CONVERGENCE CONTROLS
- Additional IMAGE CONTROLS
- Additional FRAMING CONTROLS
- LOOKS (CUBE/3D LUT)
- Paste Special

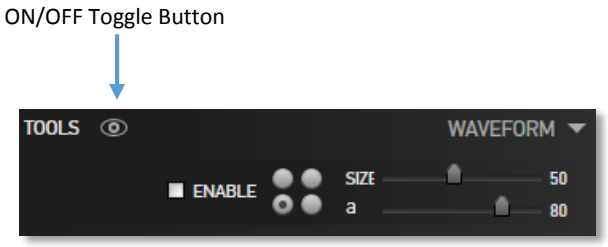
Outside the GoPro Studio application:

- Unrestricted spatial resolution (encode at resolutions higher than 8K)
- Chroma sampling up to 4:4:4(:4) and 12-bit RAW
- Additional conversion tools that support virtually all other camera formats
- Conversion tools for DPX, TIFF, R3D and CinemaDNG file formats
- Tools for muxing existing CineForm files into Stereo (3D) CineForm files
- HD-SDI capture support (Windows only)

More information regarding additional features within GoPro Studio can be found below.

Additional Global Playback Controls

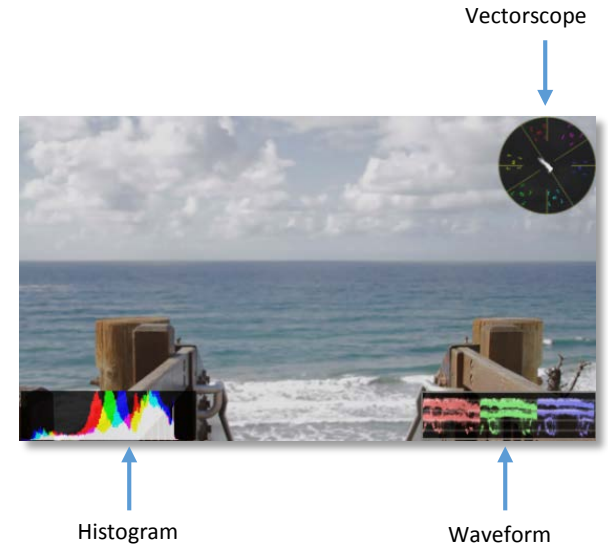
In addition to the **PLAY, VIEW** and **EXT. DISPLAY** options, GoPro Studio Premium adds the ability to add advanced monitoring tools and create and use multiple Active Metadata™ databases to the Global Playback Controls in GoPro Studio's EDIT Room.



TOOLS

The **VEW** option lets you add visual diagnostic displays overlaid on top of your video for more precise adjustment. To "turn on" the tools overlay do the following:

1. Click the ON/OFF Toggle button (this looks like an eyeball) next to the word "TOOLS".
2. Choose a specific tool from the drop-down menu.
3. Check the "ENABLE" checkbox.
4. Use the sliders to set the size and opacity levels.
5. Use the placement buttons to indicate in which corner of the frame to anchor the overlay.



WAVEFORM

The waveform display shows levels for each color channel (red, green and blue) and is particularly useful for analyzing the color balance of your footage (the adjustments you make affect each color channel). Tone-scale is mapped with the brightest point on top and darkest on the bottom.

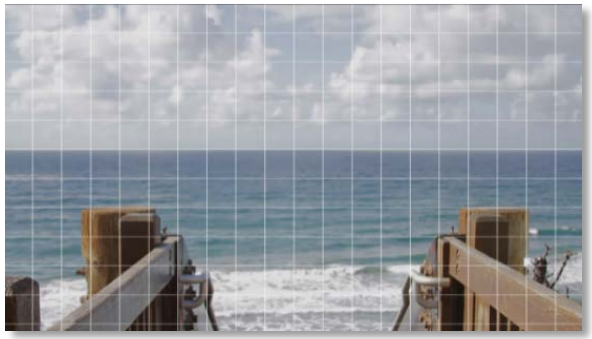
HISTOGRAM

The histogram display is well-known to those who do digital image editing on still photographs. The histogram displays the tone-scale of an image in component colors horizontally with darkest tones on the left and lightest on the right.

VECTORSCOPE

The role of the vectorscope is to illustrate color hue and saturation vs. the luminance (sometimes referred to as "brightness") the waveform and histogram displays are intended to measure. You'll notice the color targets charted around the "clock" positions around the display, where the display indicates color content in the image. As you look at the display, color saturation is shown as distance from the center (more saturated colors

will show indication closer to the outer edge). The hue of the color information is indicated by the "clock" position, and the colored targets indicating the primary (red, green, and blue) and secondary (magenta, cyan, and yellow) colors reference the positions of each hue.



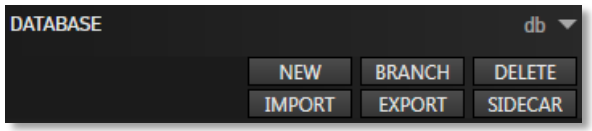
Grid Enabled

GRID

The grid display is useful for tracking particular items in the composition of your images, and can also be useful for left eye/right eye alignment when working with stereo (3D) footage. The grid spacing is adjusted with the size slider. The corner placement buttons do not affect the grid.

TIP: Clicking on the ON/OFF Toggle button (which looks like an eyeball) will toggle the TOOLS overlay ON or OFF for all GoPro CineForm clips. You can use this to quickly switch back and forth between seeing the clips with the TOOLS enabled and disabled.

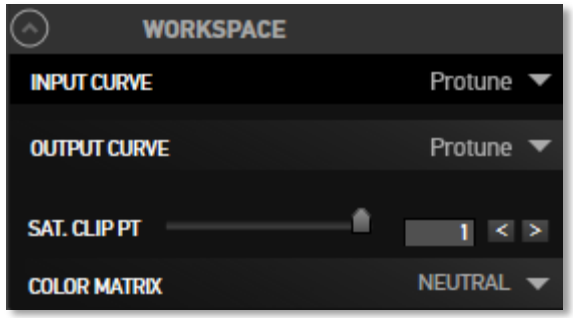
DATABASE



The **DATABASE** is where all your Active Metadata™ adjustments are saved. With GoPro Studio Premium, you can create and switch between multiple databases. This lets you give your clips multiple looks without having to create or render new files. The DATABASE controls consist of a drop-down menu that lets you choose the current database as well as a group of buttons that perform the following actions:

- **NEW** creates a new database and all existing adjustments will be cleared, resetting all clips to their original values.
- **BRANCH** creates an alternative database based on the current database (essentially saving the current database with a new name).
- **DELETE** erases the current database from the drop-down menu and your computer.
- **IMPORT** lets you import a GoPro Studio database file that you exported from another computer.
- **EXPORT** lets you export a GoPro Studio database for the purpose of copying it to another computer.
- **SIDECAR** creates a companion database for the current clip only allowing you to share that clip with other computers while retaining the Active Metadata™ adjustments.

WORKSPACE Controls

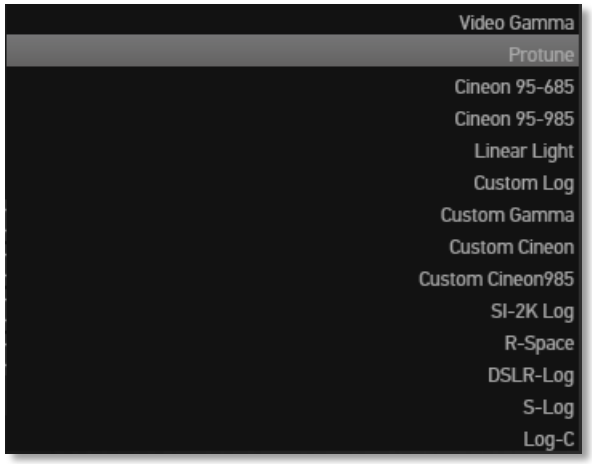


GoPro Studio Premium adds an additional control panel to the right-hand side of the EDIT room. Select a clip in the Media Bin and then click on the **Disclosure Triangle** to the left of the words "WORKSPACE" to open the WORKSPACE panel giving you access to the following settings:

- **INPUT CURVE**
- **OUTPUT CURVE**
- **DEMOSAIC TYPE**
- **SAT. CLIP PT**
- **COLOR MATRIX**

These controls affect how GoPro Studio handles the luminance and chroma values of your clips. Let's look at each of these in a little more detail.

INPUT CURVE



The **INPUT CURVE** allows you to define the curve applied to the data prior to CineForm encoding. Defining the input curve as part of the metadata fields provides information to the CineForm decoder engine such that it knows how to apply the inverse curve to restore to linear light. This is useful because it is preferred to apply color processing on linear data, not data to which a curve is already applied.

OUTPUT CURVE

The **OUTPUT CURVE** is independent from the INPUT CURVE and allows you to specify the curve used for presentation. The default setting is to use the same curve as the INPUT CURVE. Shown at left are other available options. The Primaries curve gives you two options as to how your color corrections are applied. You can choose linear space or in the space of your output curve. This will modify how your corrections are interpreted, but it is your preference as to how you would rather work.

DEMOSAIC TYPE

The DEMOSAIC TYPE only appears when CineForm RAW files are selected in the Media Bin or Storyboard and it determines the algorithm used to convert the one value per pixel of a raw bayer sensor to the more useful three color primaries per pixel, RGB.

There are over a hundred different demosaic algorithms available today and although some look more natural than others, there is no right or wrong choice. Using the DEMOSIAC TYPE you can choose from a variety of different demosaic algorithms suitable for CineForm RAW encoded files.

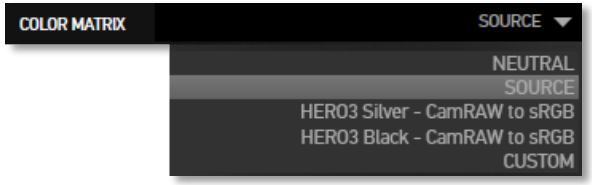
'BiLinear Demosaic' is a simple, fast demosaic filter suitable for real-time playback but not suitable for final rendered output. During editorial it is helpful to use BiLinear Demosaic because it requires the least CPU resource.

TIP: Think of the progression of Demosaic algorithms between BiLinear and CF Advanced Detail 3 as providing additional sharpening detail in your final output.

SAT. CLIP PT

The SATURATION CLIP POINT is used when a combination of Active Metadata™ adjustments or a specific LUT has driven the clip's color saturation beyond what is supported by your output format. Use the Slider or step controls to clip the saturation to the point where the image looks correct.

COLOR MATRIX



The COLOR MATRIX drop-down menu specifies the base color matrix upon which to apply the corrections. Most sources will use 'NEUTRAL', but if your source has an existing matrix, like with the Silicon Imaging SI-2K, 'SOURCE' should be used. If you have previously defined a custom color matrix using an older version of CineForm software, select 'CUSTOM' to preserve it.

If you have processed an HD HERO3 Silver or HD HERO3 Black source file through another application prior to converting it to a GoPro CineForm file, you can use the appropriate option here to tell GoPro Studio which matrix to use.
Click on the **Disclosure Triangle** to close the WORKSPACE panel.

Additional Video Playback Controls

GoPro Studio Premium adds additional features to the Video Playback Controls which enable you to apply Speed-Ramping effects to your clips.

- **KEYFRAMES** By using keyframes, you can cause the speed of the clip to change over time.
- **SPEED MULTIPLIER** Use this slider to increase or decrease the overall speed of a clip when keyframes have been applied (this control becomes available after setting an initial keyframe).

Here's an example of how you can use these controls to apply a speed-ramp effect.

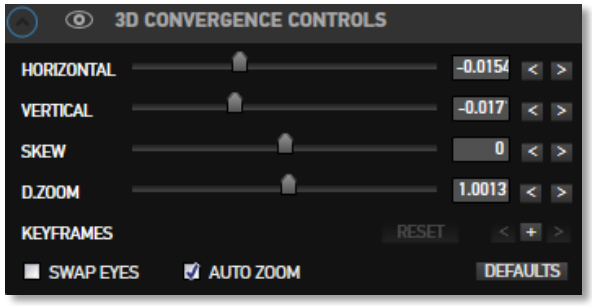
1. Select a clip in the Storyboard and select an initial speed for the clip by using the SPEED slider or by typing in a percentage in the SPEED text entry box. For this example, just leave it at 100%.
2. Move the Play-head to a new location on the Playback Slider. Move it to a location that is a half-a-second before something cool is about to happen in the clip.
3. Press the + button to create a keyframe. By creating a keyframe, you are enabling the keyframe feature. This also adds an initial keyframe to the beginning of the clip. Keep this keyframe at 100%. The clip will play at 100% speed from the beginning of the clip all the way to this newly added keyframe.
4. Now move the Play-head a half a second forward (to the point where the action begins) and then use the SPEED slider or text entry box to reduce the speed of the clip to 50%. Changing the speed will automatically add a new keyframe to this location in the clip. By doing this, the portion of the clip between this new keyframe and the previous keyframe will play back with the speed gradually changing from 100% to 50%.
5. Move the Play-head to the point right after the trick and press the + button again to lock in the speed at 50% for the duration of the action.
6. Move the Play-head about a half a second further down the Playback Slider and set the SPEED back to 100%. This will automatically add a new keyframe at this location on the clip and ramp the speed from 50% back to normal (100%).
7. Move the Storyboard Time Indicator to the beginning of the clip and press PLAY in the Playback Controls to watch the clip start at normal speed, then gradually

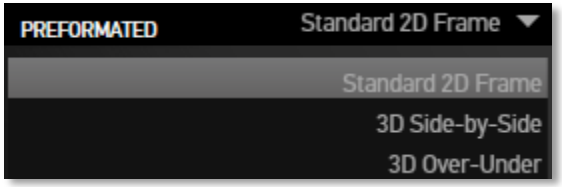
slow down to half-speed, continue at half-speed for the duration of the clip and then gradually speed back up to normal speed when the action is complete.

You can further change the speed of the clip over time by simply adding more keyframes. Use the step controls to cycle through existing keyfames and press the - button to remove an existing keyframe.

If you're happy with the ratio of your speed changes but want to lengthen or shorten the overall duration of the clip, you can use the SPEED MULTIPLIER slider or text entry box to increase or decrease the length of the clip without affecting the keyframe locations. This will scale the percentages higher or lower depending on whether or not you're increasing or decreasing the value of the SPEED MULTIPLIER.

Additional 3D CONVERGENCE Controls





GoPro Studio Premium adds a few new options to the 3D CONVERGENCE CONTROLS panel.

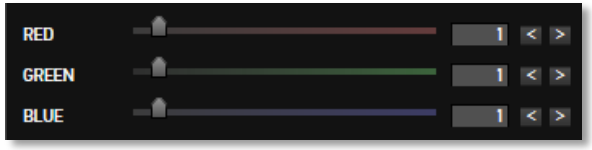
The **D.ZOOM** slider lets you correct for differences in the zoom levels between the left and right camera eyes. This is useful if your cameras were not on the same z-plane when shooting your footage.

Additionally, you'll find an **AUTO ZOOM** checkbox. In the free version of GoPro Studio, this option is used by default and you don't have the option of disabling it. GoPro Studio Premium lets you uncheck this option so that your 3D convergence adjustments don't automatically zoom in to crop any edge areas that become misaligned.

GoPro Studio Premium also adds the **DEFAULTS** button, which lets you reset all of the values in the 3D CONVERGENCE CONTROLS panel to their original settings.

Lastly, GoPro Studio Premium adds a **PREFORMATTED** drop-down menu that lets you assign a 3D mode to clips that were recorded in-camera using a side-by-side or over-under 3D mode. This will cause GoPro Studio to properly recognize these files as 3D, thus allowing you to use the 3D Convergence adjustments on them.

Additional WHITE BALANCE Controls



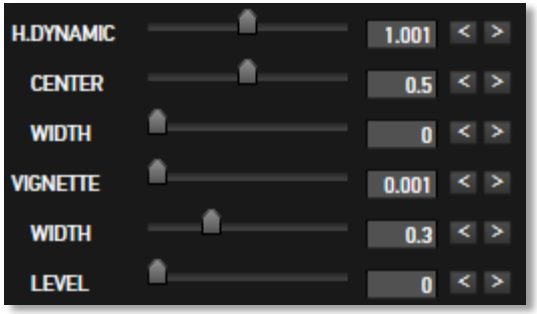
In addition to the existing **TEMP** and **TINT** controls, GoPro Studio Premium includes **RED, GREEN** and **BLUE** sliders to the WHITE BALANCE controls. These allow adjust the white balance of the image on a per primary color basis.

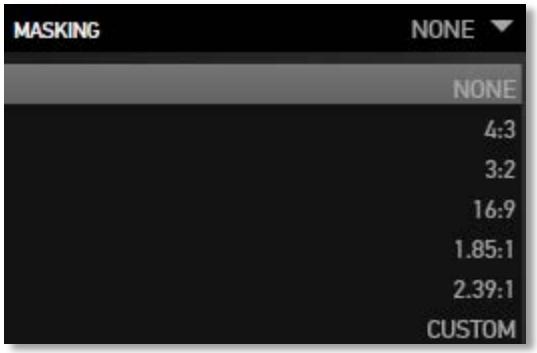
Additional IMAGE CONTROLS

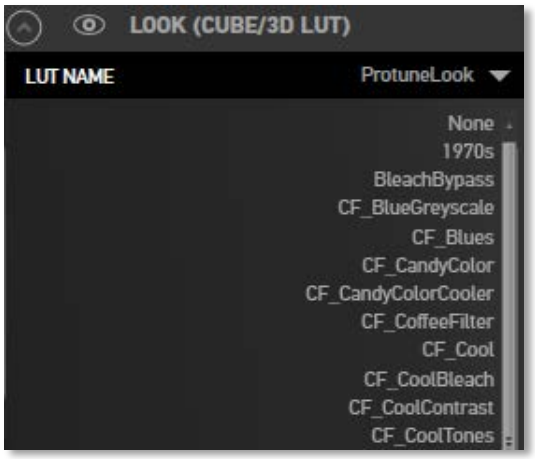
In addition to the existing **EXPOSURE, CONTRAST, SATURATION** and **SHARPNESS** controls, GoPro Studio includes the following new controls to adjust the chroma and luminance values in your images.

- **GAIN** (used to adjust highlights)
- **GAMMA** (used to adjust mid-tones)
- **LIFT** (used to adjust shadows)

Each of these new controls includes a slider for overall adjustment as well as individual **RED, GREEN** and **BLUE** sliders to affect the image on a primary color-by-color basis.







Additional FRAMING CONTROLS

The FRAMING CONTROLS get a facelift in GoPro Studio Premium as well. The **H.DYNAMIC** control benefits from a couple of new sub-controls to adjust the **CENTER** point and **WIDTH** of the horizontal dynamic adjustment. These sub-controls appear after you have made an initial adjustment to the H.DYNAMIC control.

There's also a new **VIGNETTE** control with **WIDTH** and **LEVEL** sub-controls. These let you add a vignette to your clips. The sliders adjust its size, edge-feathering and opacity level.

In GoPro Studio Premium, the FRAMING CONTROLS also include a MASKING drop-down menu which lets you select between any of the following masking options:

- **NONE**
- **4:3**
- **3:2**
- **16:9**
- **1.85:1**
- **2.39:1**
- **CUSTOM**

Choosing one of the MASKING options will add black borders to the top and bottom or left and right edges of your clips.

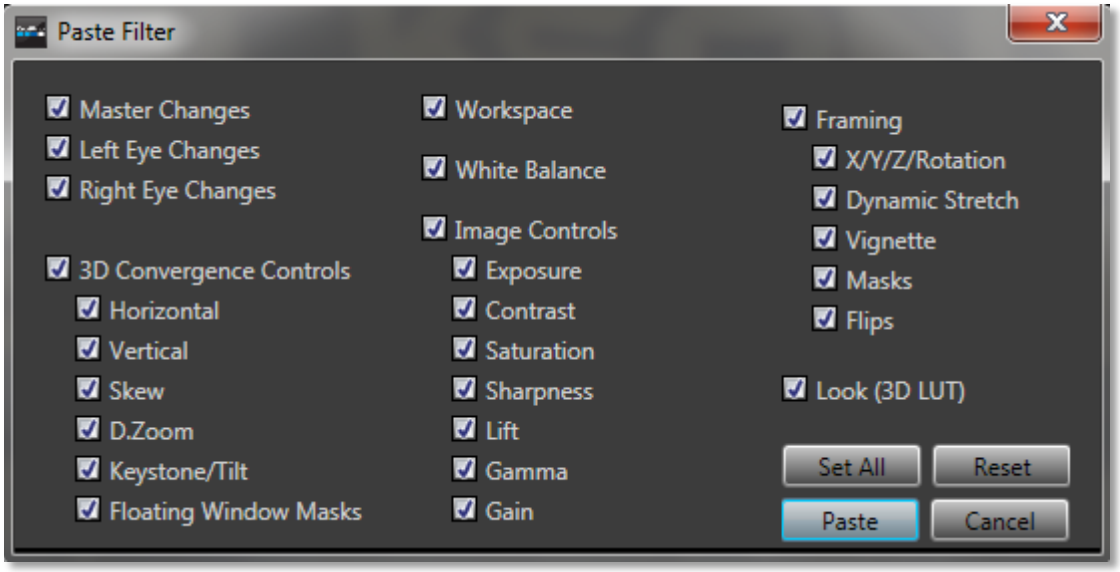
LOOK (CUBE/3DLUT)

GoPro Studio Premium adds the ability to use various color look-up tables to change the character of your images by simulating the color rendition of various film stocks and film processing styles.

NOTE: When you convert files that were shot using the GoPro Protune mode, the 'ProtuneLook' LUT is automatically applied to the converted clip.

Paste Special

To copy only some of the settings from one clip to another, rather than using the “Paste” command in the EDIT Menu, use the “Paste Special” command (Ctrl+Shift+V). This will bring up the PASTE FILTER window, where you can choose which settings will be pasted by checking or unchecking the individual settings boxes.



GoPro Studio Professional

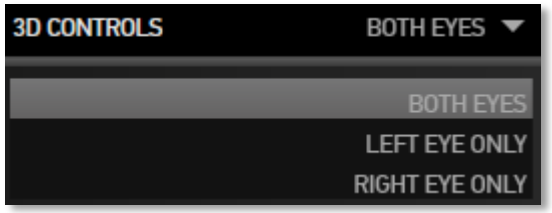
GoPro Studio Professional contains all the features mentioned so far from GoPro Studio (free) and GoPro Studio Premium and adds the following professional 3D features:

- Additional Global Playback Controls
- Additional 3D CONVERGENCE Controls

Additional Global Playback Controls

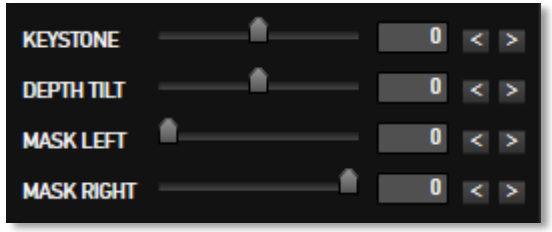
The Professional version adds the following to the Global Playback Controls to GoPro Studio's EDIT Room.

3D CONTROLS



The **3D CONTROLS** drop-down menu lets you choose which eye(s) will be affected by the Active Metadata™ adjustments applied in GoPro Studio's EDIT Room. You can choose between BOTH EYES, LEFT EYE ONLY and RIGHT EYE ONLY. This comes in handy if you need to make color or other adjustments to a single eye in the clip or if you need to flip the image in one of the eyes. This is often the case when shooting 3D video with a mirror rig or other dual-camera 3D recording system.

Additional 3D CONVERGENCE CONTROLS



The Professional version of GoPro Studio adds the following additional 3D CONVERGENCE controls:

- **KEYSTONING** to adjust camera toe-in/out
- **DEPTH TILT** to adjust relative depth of primary objects
- **MASK LEFT** and **MASK RIGHT** to manage edge violations

These controls are useful when dealing with 3D content captured using dual-camera 3D recording systems.

APPENDIX A: KEYBOARD SHORTCUTS

Import Room

Space	Play/Pause
Right/Left Arrow	Step Forward/Back one frame
Shift + Right/Left Arrow	Step Forward/Back ten frames
Down/Up Arrow (in import bin)	Next/Previous clip in bin
CTRL+A (in import bin)	Select all clips
I	Set In Point to current frame
O	Set Out point to current frame
DEL	Remove selected clip(s) from bin (import or conversion)
Home/End	Seek to beginning/end of clip
ALT+Enter	Full screen video playback
ESC	Exit full screen video playback

Edit Room – Media Bin

Space	Play/Pause
Right/Left Arrow	Step Forward/Back one frame
Shift + Right/Left Arrow	Step Forward/Back ten frames
Down/Up Arrow (in edit bin)	Next/Previous clip in bin
CTRL+A (in edit bin)	Select all clips
I	Set In Point to current frame
O	Set Out point to current frame
Delete	Remove selected clip(s) from edit bin
Home/End	Seek to beginning/end of clip
J	Decrease forward play speed/increase reverse play speed
K	Stop play
L	Increase forward play speed/decrease reverse play speed
ALT+Enter	Full screen video playback
ESC	Exit full screen video playback

Edit Room- Storyboard

Space	Play/Pause
Right/Left Arrow	Step Forward/Back one frame
Shift + Right/Left Arrow	Step Forward/Back ten frames
I	Set In Point to current frame
O	Set Out point to current frame
Delete	Remove selected element from storyboard
Page Down/Up	Next/Previous edit point in storyboard
Insert	Split Clip
Home/End	Seek to beginning/end of storyboard
J	Decrease forward play speed/increase reverse play speed
K	Stop play
L	Increase forward play speed/decrease reverse play speed
ALT+Enter	Full screen video playback
ESC	Exit full screen video playback

APPENDIX B: GOPRO STUDIO EXPORT PRESETS

The following table presents the particular characteristics of each export preset available in the EXPORT Window:

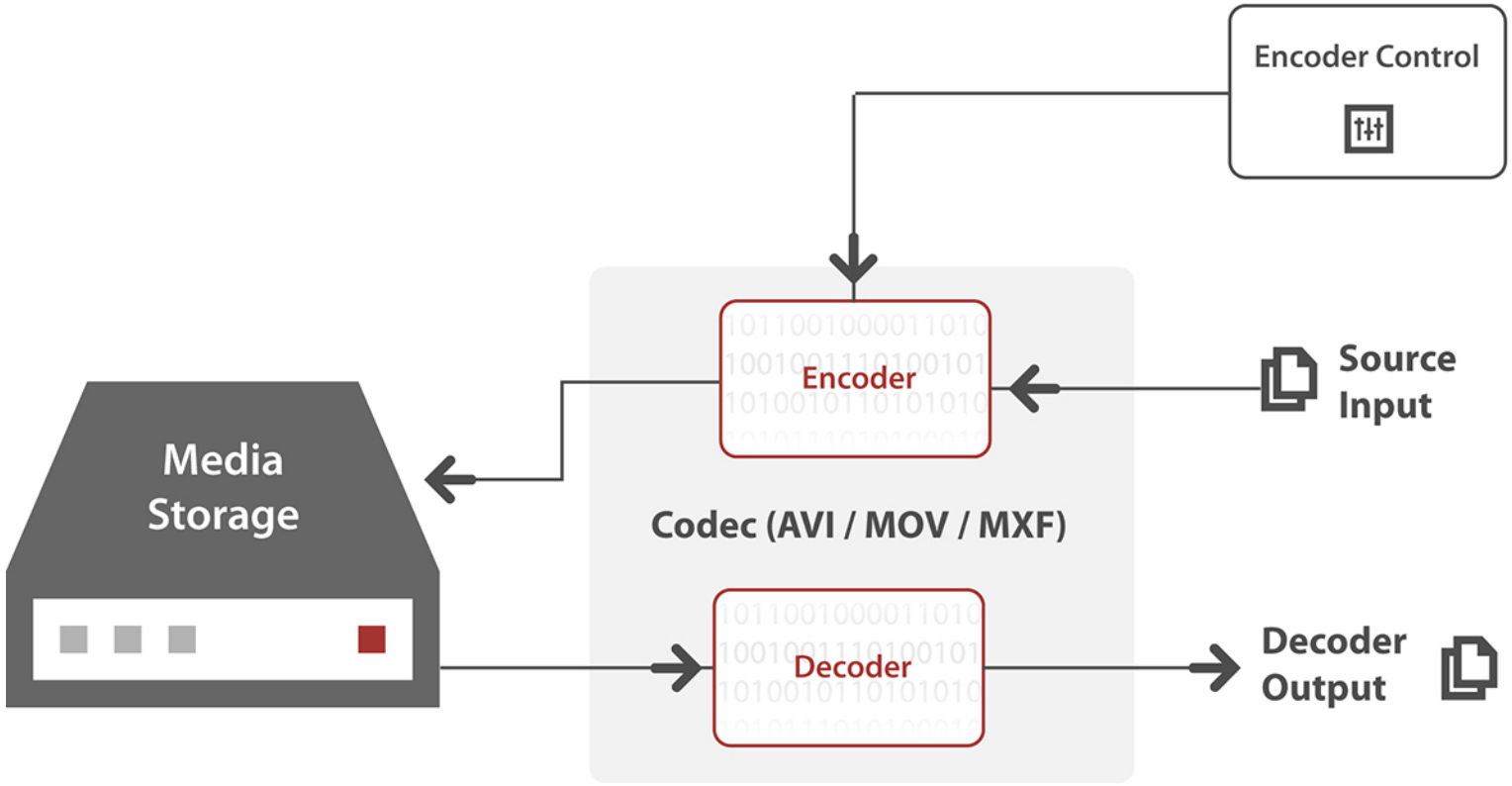
PRESET	*RESOLUTION*	*Export Format*	*Bitrate*	*Framerate*
Mobile	640x360	H264	1.5Mbps	Source FPS → Exported FPS: <47.95fps → Native 47.95 → 23.976 50.00 → 25.00 59.94 → 29.97 100.00 → 25.00 119.88 → 29.97 240.00 → 29.97
HD 720p	1280x720	H264	<30fps =7Mbps >30fps=15Mbps	23.976, 29.97, 59.94 → Native 47.95 → 23.976 100.00 → 25.00 119.88 → 59.94 240.00 → 59.94
HD 1080p	1920x1080	H264	15Mbps	Source FPS → Exported FPS: <47.95fps → Native 47.95 → 23.976 50.00 → 25.00 59.94 → 29.97 100.00 → 25.00 119.88 → 29.97 240.00 → 29.97
Archive	Source	CineForm	Low Medium High	Native

<table>
<tr><td>Vimeo</td><td>Native up to 1080
>1080, center crop & scale to 1080</td><td>H264</td><td>1080: 15
720: 7</td><td><table><tr><th>Source FPS</th><th>Exported FPS</th></tr><tr><td><47.95fps</td><td>Native</td></tr><tr><td>47.95</td><td>23.976</td></tr><tr><td>50.00</td><td>25.00</td></tr><tr><td>59.94</td><td>29.97</td></tr><tr><td>100.00</td><td>25.00</td></tr><tr><td>119.88</td><td>29.97</td></tr><tr><td>240.00</td><td>29.97</td></tr></table></td></tr>
<tr><td>YouTube</td><td>Native up to 1080
>1080, center crop & scale to 1080</td><td>H264</td><td>1080: 8
720: 5</td><td>Native up to 60<table><tr><td>100.00</td><td>50.00</td></tr><tr><td>119.88</td><td>59.94</td></tr><tr><td>240.00</td><td>59.94</td></tr></table></td></tr>
<tr><td>Custom</td><td>User-selectable from top 4 Settings above</td><td>User-selectable</td><td>Slider 1-50</td><td>User-selectable</td></tr>
</table>

APPENDIX B: THE GOPRO CINEFORM CODEC

Compression

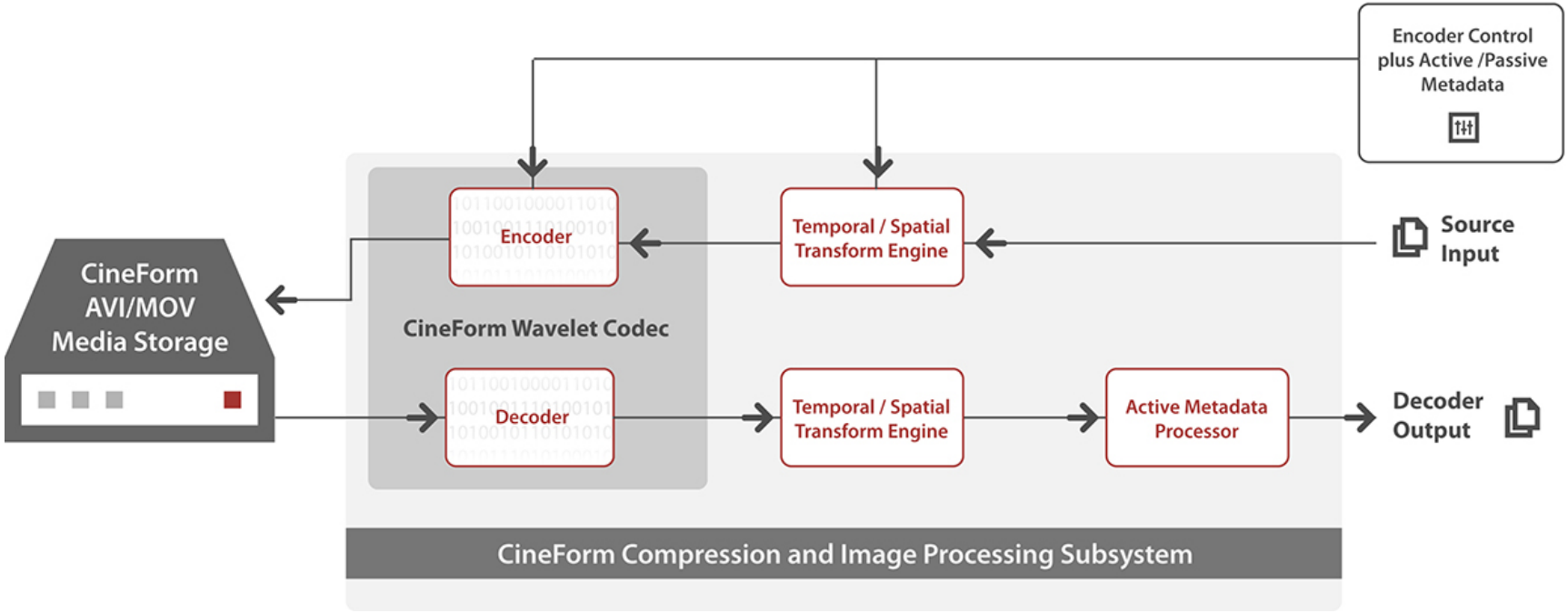
Video file formats use standard wrappers like AVI, QuickTime (MOV)or MXF to ensure broad playback compatibility with numerous video applications. Within the AVI or MOV wrapper, the underlying file might be compressed (or uncompressed) using various codecs, all of which guarantee compatibility with a calling application through OS-recognized AVI or QuickTime interfaces. The primary function of a codec is to ensure that the decoded image best represents the original uncompressed source—within the inherent constraints of the chosen codec and the parameters selected during the encode (or compression) operation.



Traditional Codec (Encoder-Decoder) Functions

Codec designs are many, as are the resulting visual fidelity and CPU requirements that result from various designs. As a general rule, most codecs have been designed for either acquiring images or video inside a camera (JPEG, DV, DVCPRO, AVCHD, DNxHD) or for distribution (MPEG, h.264).

CineForm has taken a different approach with its compression engine, instead designing a compression subsystem specifically optimized for the needs of post-production, and with the inclusion of many system features. There is a codec at the heart of CineForm's compression subsystem, but the codec is surrounded by additional processing engines that operate underneath the AVI/MOV interface layers through which calling applications access compressed data. This allows CineForm's compression subsystem to perform myriad system-level features difficult to



otherwise implement.

CineForm Compression Subsystem Architecture

Following are the major component pieces in a CineForm compression subsystem:

CineForm Wavelet Codec: The design goals for CineForm's codec were:

1. Maintaining extremely high visual fidelity through a rigorous multi-generation post-production workflow, including high bit precision, yielding high signal-to-noise ratio.
2. Offering extremely fast performance on Intel architecture CPUs such that multiple streams can be processed in real time without the need for specialized hardware.

The design characteristics of the GoPro CineForm codec are the following:

Transform: Full-frame Wavelet. "Full-frame" means the entire image is transformed without breaking the image into "blocks" which are the basis for DCT-style transforms (JPEG, MPEG, AVCHD, etc.), and which provide the ubiquitous artifacts often visible in complex image sequences. CineForm's full-frame Wavelet transform cannot suffer from these DCT image degradations.

Chroma Formats and I/O Bit Depth: 10-bit YUV, 12-bit RGB(A), and 12-bit CineForm RAW

Spatial Resolution: Unrestricted

Bit Rate: Variable (constant quality)

Encoder Quality Settings: 6 (user selectable)

Symmetry: Symmetric (similar speed for encoding and decoding)

Multi-Resolution Decoding: Wavelet algorithms offer a valuable feature for use in playback or other post-production applications: the ability to decode a full-resolution image to a lower resolution. Specifically the ability to decode to ½ or ¼ resolution in each dimension is allowed, while using less CPU load compared to a full-resolution decode. CineForm software dynamically takes advantage of this characteristic during editorial.

Performance: Function of CPU speed and memory bandwidth, but below are representative examples run on a 3.2GHz Intel Corei7 (single chip quad core):

10 bit 1920×1080 4:2:2	**232 fps**
12 bit 1920×1080 4:4:4 (CineForm 444)	**104 fps**
12 bit 4096×2048 4:4:4 (playback at 2K)	**52 fps**
12-bit 4096×2048 4:4:4 (playback at 4K)	**20 fps**

Relative Performance (versus JPEG2000): CineForm compression ranges from around 5X to 10X faster than JPEG2000. Compression performed by CineForm in an hour may take up to 10 hours for JPEG2000 to perform on the same imagery.

Visual Quality (versus HDCAM SR): CineForm visual fidelity routinely exceeds that of the respected HDCAM SR format which is a mainstay in professional production and post-production. Read additional quality analysis versus HDCAM SR on StEM test footage….

Visual Quality (versus HDV and DVCPRO HD): CineForm visual fidelity substantially exceeds that of most camera compression formats such as HDV, DVCPRO HD, AVCHD, etc.

Temporal/Spatial Transform Engine: The Transform Engine allows source and output formats to be different than the compressed format, in either spatial resolution or chroma format.

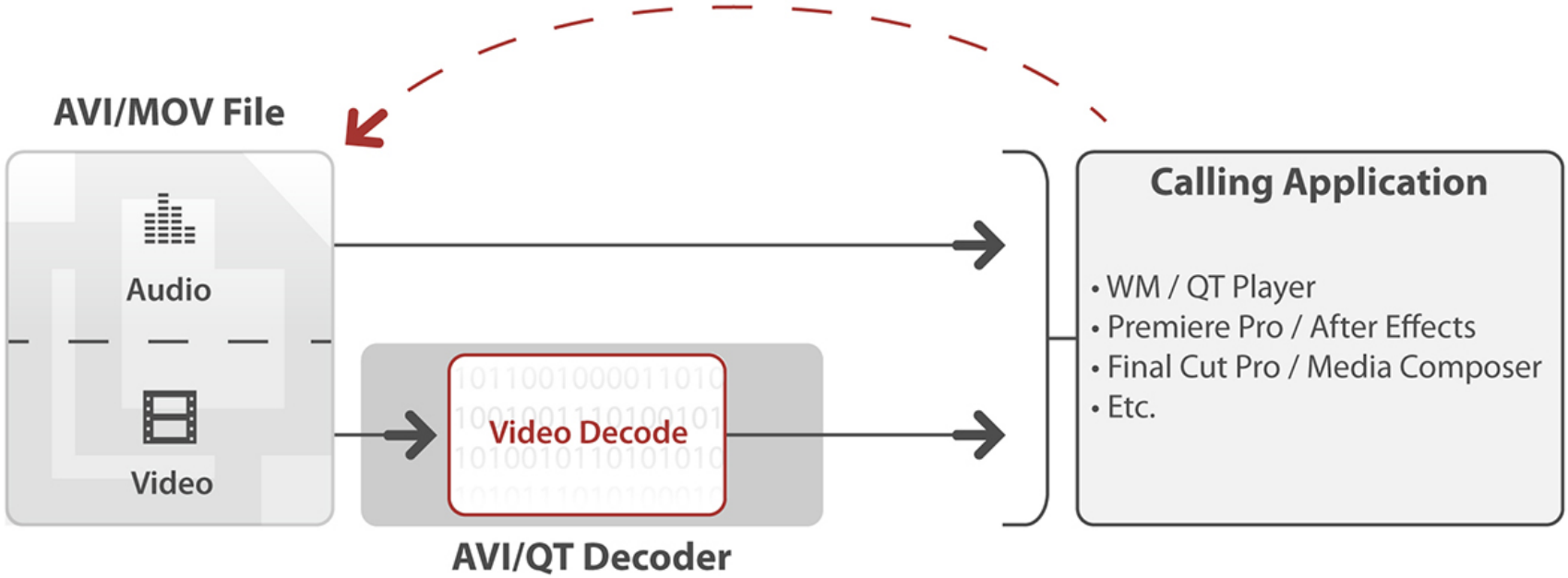
Spatial Transforms: CineForm spatial processing is unrestricted and handles all standard resolutions: SD, HD, 2K, 4K and beyond.

Color Space Transforms: Color space transforms can move images between RAW, 4:2:2 and 4:4:4 chroma in real time. Transforms are always performed using floating-point arithmetic to preserve color accuracy. When decoding from CineForm RAW sources, CineForm's demosaic algorithms are performed in real time.

Active Metadata Processing Engine: CineForm's Active Metadata Processor allows numerous non-destructive operations to be performed on image frames after decompression including color processing (white balance, gain/offset, gamma, saturation, RGB matrix controls, 3D LUTs and more), image flip, 3D processing and more.

Active Metadata™ Technology Overview

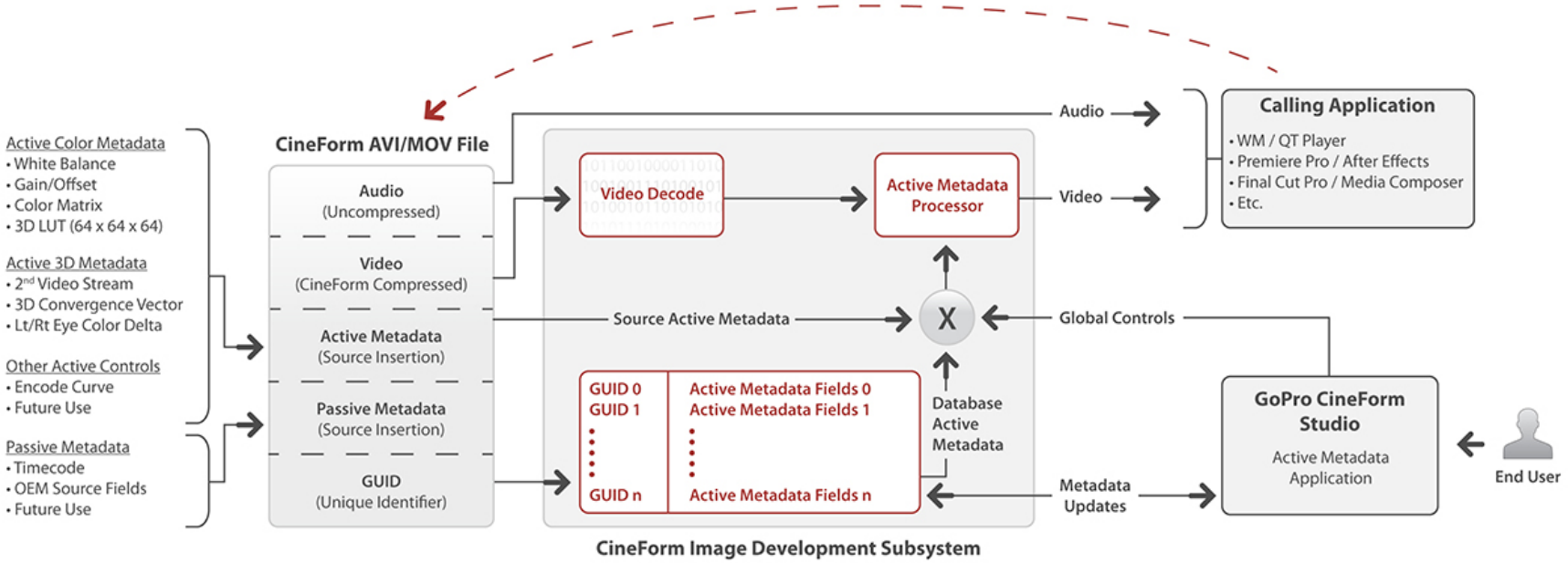
Video file formats use standard wrappers like AVI, QuickTime (MOV) or MXF to ensure broad playback compatibility with numerous video applications. A calling application requests frames from AVI/MOV files which are in turn decoded and presented to the calling application similar to the diagram below. Within the AVI or MOV wrapper, the underlying file might be compressed (or uncompressed) using various codecs, all of which guarantee compatibility with a calling application through OS-recognized AVI or QuickTime interfaces.



Traditional request by a calling application to “play” (or decode) a compressed file.

Using its **Active Metadata™** architecture CineForm extends traditional codec-only capability into a full-featured image development subsystem, including:

- Combining “active” processing of decoded images with metadata based on user-established rules. Active processing allows non-destructive image development including color (White Balance, color matrix, 3D LUTs, etc.), 3D editorial and playback, stream-specific information and framing controls
- Metadata storage is inside the video essence within user data fields compatible with AVI/MOV files
- Active Metadata is compatible with all CineForm file types: 10-bit YUV, 12-bit RGB, 12-bit RAW and stereo (3D)
- Cross-platform (Win/Mac) and cross-applications compatibility. Active Metadata is transparent to a calling application because all Active



Metadata processing occurs within the CineForm Image Development Subsystem, prior to presenting the images to the calling application.

When a CineForm AVI or MOV file is created, active and/or passive metadata may be inserted into the file. In all cases a Globally Unique Identifier (GUID) is inserted into the file, plus the encoder curve used when the file was created. If available, Timecode is written into a Passive Metadata field.

The GUID provides a lookup address into the CineForm Active Metadata Database file used during playback.

The encoder curve is included to establish the inverse curve necessary to return to linear light upon decode.

The following are a few examples of Active Metadata insertion into GoPro CineForm AVI/MOV files:

- When recording to disk during live capture using a Silicon Imaging camera, white balance and 3D LUT information is written into the CineForm RAW file.
- When performing disk-based conversions from RED R3D files, white balance information from the RED metadata fields is extracted from the RED SDK and written into the CineForm file (YUV, RGB, or CineForm RAW) as Active Metadata.
- When a stereo (3D) CineForm file is created, the second stream is stored as Active Metadata, plus other optional fields.

GoPro CineForm Studio allows for:

- Modifying Active Metadata. Active Metadata created at source file origination always resides inside the file and can never be modified. Modifications to Active Metadata are stored in CineForm's Active Metadata Database file. GoPro CineForm Studio allows a user to revert to the source metadata regardless of future metadata modifications within the Studio application.
- Setting Global Playback controls. You can define for playback that all, none or only a portion of the Active Metadata should be applied upon decode. A couple examples of when this is useful:
    - During editorial with CineForm files, the editor may have used Active Metadata color to establish look-intent. But when rendering from a CineForm file to DPX files a choice might be made to only apply white balance and not apply the color look-intent used during editorial with Active Metadata.
    - During 3D playback, global playback controls allow the user to choose whether to play a CineForm stereo file as 2D (either Left eye or Right eye), or as one of four different 3D presentation formats (side-by-side, over-under, field interlace or anaglyph).
- Defining the rules for applying CineForm's numerous demosaic algorithms for CineForm RAW content during playback or rendering.

When a calling application requests playback of a CineForm file, the Active Metadata processor computes the final output based on user-defined global playback rules, plus individual Active Metadata fields.